TECHNOLOGY DEPT.

- St. Regis' expansion at Jacksonville – Part I
- Selective application of starch
- Deinking properties of dyestuffs
- NSSC liquor recovery

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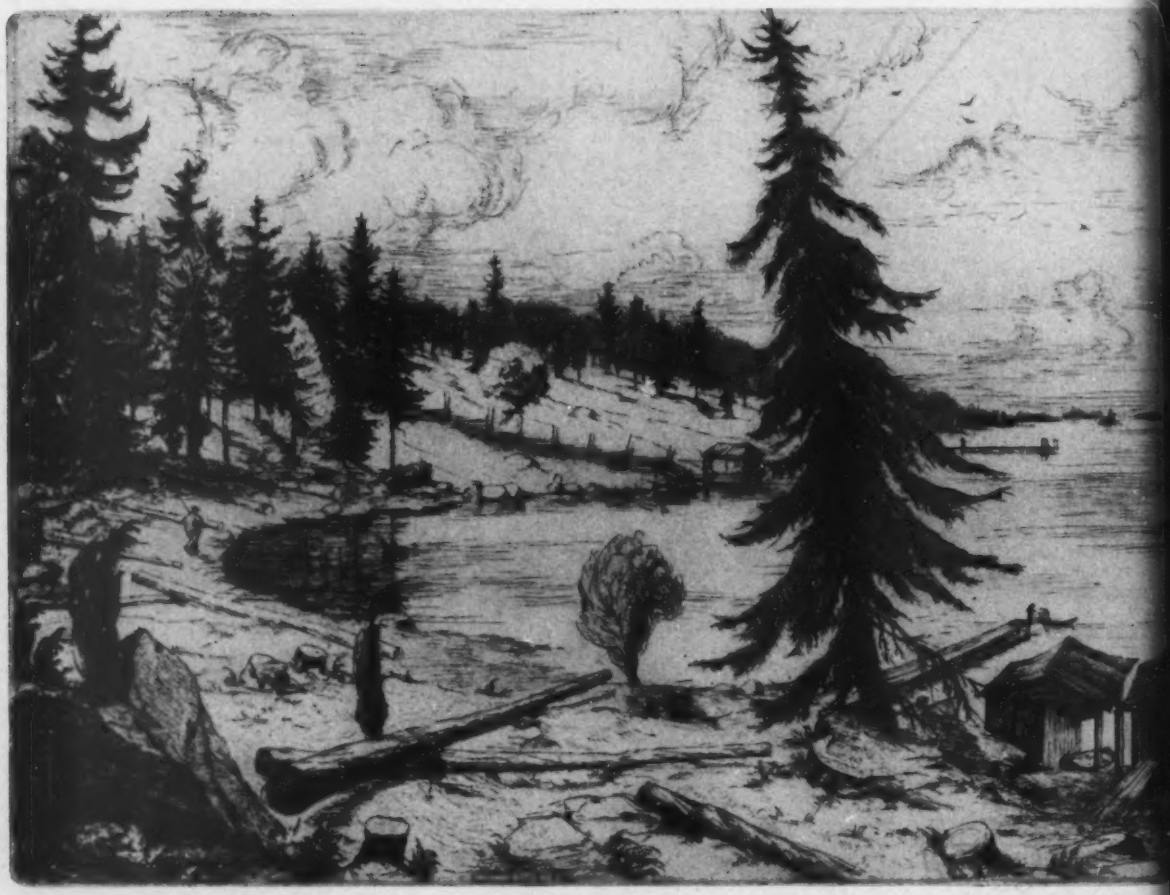

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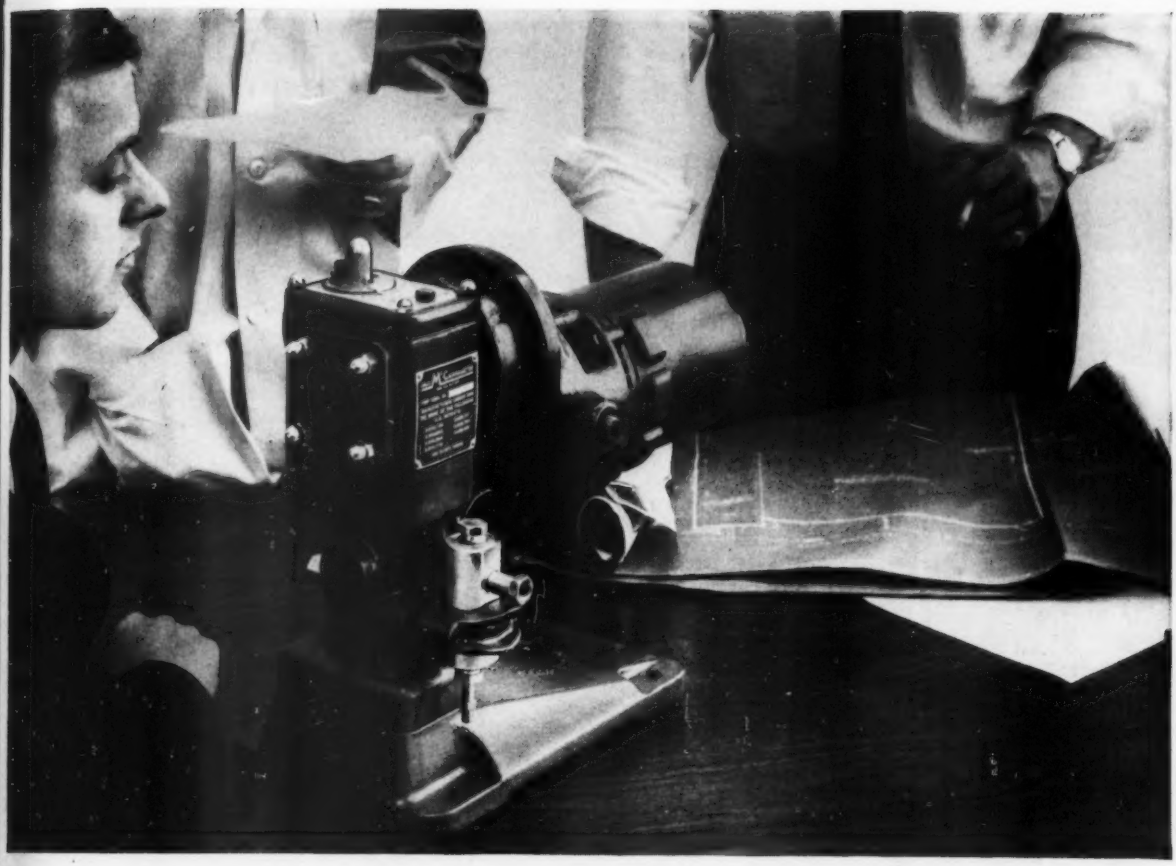

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The Paper Industry

Technology • Engineering • Management • Production

VOLUME 39 **NUMBER 11** **FEBRUARY 1958**

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From our point of view . .

The inter-relation of research with manufacturing, sales and management

The fact that research now is a must with every industrial establishment that leans heavily upon the benefits derived from the application of modern technology is generally accepted. What is not as clearly understood is the inter-relation of research with the other phases of a company's activities and the position research should occupy in the company's corporate structure.

Such inter-relation was thoroughly covered during a panel discussion at the recent meeting of the Canadian Pulp & Paper Association in Montreal. Moderator of the panel was Dr. W. Gallay of E. B. Eddy Co., while the participants included such other industry notables as D. W. Ambridge, president of Abitibi Power & Paper Co. Ltd.; A. C. Hill of Anglo Paper Products Ltd.; D. E. Read of Industrial Cellulose Research Ltd., and C. A. Sankey of Ontario Paper Co. Ltd.

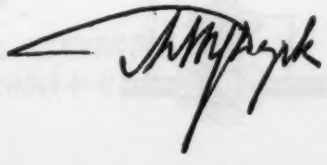
The discussions were oriented from the point of view of management, manufacturing, sales and research, and as such they were extremely well focused on the main points of the basic problems. They included the factual presentation of a case history of the development of a research program at Abitibi, as well as the more theoretical but equally important plans for a successful inter-relation between research, manufacturing and sales.

A point that requires special mention was colorfully brought out by Mr. Ambridge. It concerned the difficulty encountered by management in (1) evaluating the percentage of the company's profits that can be directly credited to research, and (2) attempting some measure and prediction of the time interval required to crown a given research investigation with some concrete and useful results.

Mr. Ambridge suggested that management, when concerned with these particular problems, should look back and examine the progress made by the company over a number of years. It should then ask itself the question, "Where would our firm be today if we did not have a research department?" In Mr. Ambridge's words, the posing of this question is the greatest tonic for a worried management.

Among the responsibilities of research—on which there seemed to be unanimous agreement—were the need for an unimpaired two-way communications program between research and other company divisions; an understanding and appreciation of the company and its objectives; the need for research to function as part of the company team; and the need for a long-range view of the company technology—not allowing immediate problems best handled by technical control to upset the adopted research program.

This panel discussion was well planned and extremely well presented, reflecting a maturity of thought that is desperately needed to restore public confidence in the high quality of North American research.



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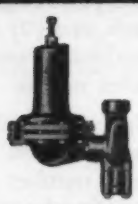

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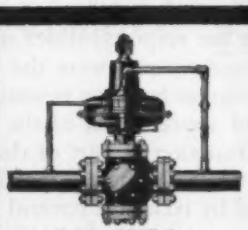

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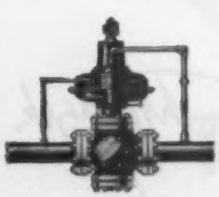

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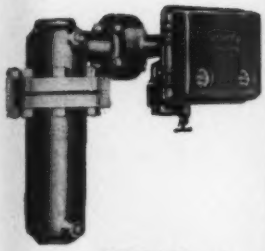

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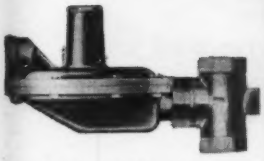

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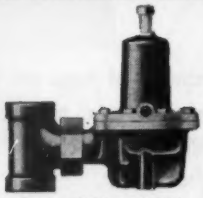

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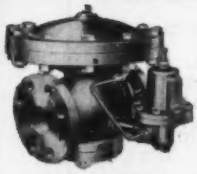

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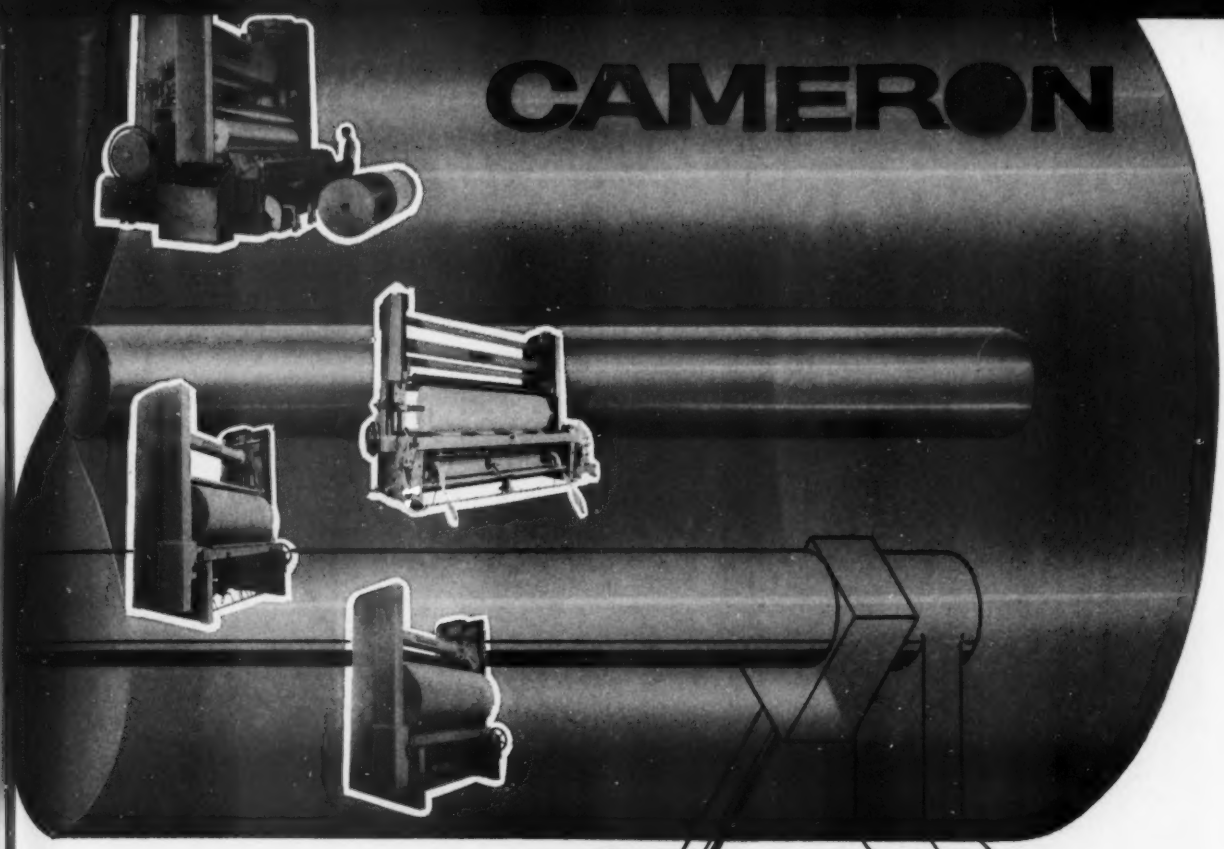

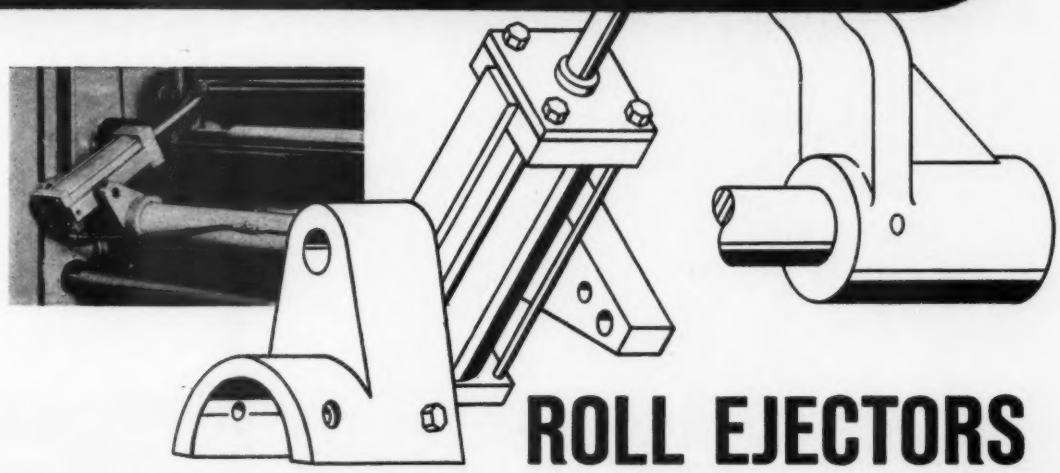

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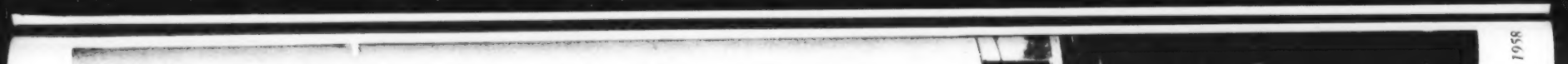

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Feature articles

St. Regis completes southern expansion

Part I — Wood-handling, chip preparation, chip digestion, brown stock washing, stock preparation

The installation of the new 1000-ton capacity Beloit board machine entailed the enlargement of the wood-handling operation and the addition of eight new digesters, brown stock washers and stock preparation equipment.

ST. REGIS Paper Co.'s expansion in the South, almost continuous since this company began operations at Pensacola Fla., in 1946, has come to a temporary standstill with the completion of its latest expansion program, which started in 1955.

This expansion program includes an enlarged wood-handling operation, expanded power generating facilities, a new pulp mill and a new 2500-fpm paper machine with a daily capacity of 1000 tons of kraft board. This expansion brings St. Regis' total capacity at the Jacksonville mill to 1300 tons.

The new paper machine, known as the "Seminole Chief", is the newest and largest in the South. It is designed to manufacture natural kraft paperboard used primarily in making corrugated containers.

The engineering work on the structural and architectural design, as well as layout and process arrangement for the entire expansion, were carried out by J. E. Sirrine Co. General construction contractor was Tidewater-Auchter Co. of Jacksonville, Fla. Engineering work on the structural and architectural design was by Stevenson & Rubens of Seattle, Wash.

Wood-handling

In the woodhandling area a 500-ft. steel-lined flume was installed between the two existing flumes, and an 860-ft. flume was added east of the existing flume system. The new flumes are equipped with a grit and traveling screen for solids and bark removal. Water is handled in the flume system by two 16,000-gpm pumps that are belt-driven by 100-hp motors.

Other additions in the wood-handling area included two rail spurs, two barking drums, five new chip storage silos and chip unloading facilities.

Pulpwood is handled from rack cars or trucks by two 3900-B crawler cranes equipped with one-cord orange peel grapples and a 17½-ton rubber tire-mounted crane with wood-rake attachment.

A three-strand jack ladder and two double-strand log conveyors, the latter operating at speeds of 100 fpm and driven by 40-hp gear motors, convey the logs to the chain-suspended, 6-rpm barking drums. The drums are 12 ft. in diameter and 67½ ft. long. Each drum consists of three sections provided with individual chain drives from drum to sprocket shafts and then through a gear reduction set to the pulley shafts. Two sections with chain and gear drives are combined with a single V-belt drive and a 150-hp motor. The third section is driven by a separate V-belt drive and a 75-hp motor.

The logs are barked dry, and the bark drops through the openings of the M-bars into a steel hopper and a bark conveyor at the bottom of each drum that takes it to the bark hog, which has a rated capacity of 60,000 lb. per hour and is equipped with swing hammers.

Debarked wood is conveyed by single-strand chain conveyors to two 104-in. 10-knife chippers equipped with split cover, spouts and discs having the new uni-chip knife mounting. The chippers are driven by 1000-hp, 360-rpm direct-connected synchronous motors. Chips are discharged to a 48-in. belt conveyor for ultimate distribution to five new and three existing chip silos that are 42 ft. in diameter and 65 ft. high.

The chip-handling system for purchased chips coming in by truck or rail consists of a two-strand conveyor operating at 50 fpm, an overhead crane trolley (15-ton) for trailer dumping and car shakeout.

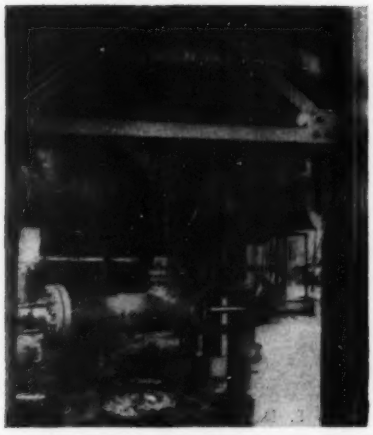
The chip silos are equipped with 17-ft. diameter rotary plate feeders operating at 2.8 rpm and designed for handling 15,000 cu. ft. of chips per hour.

Pulp mill

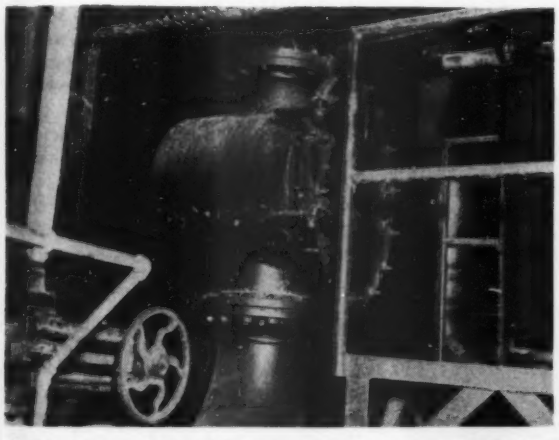
A 48-in. belt conveyor operating at a belt speed of about 400 fpm carries the chips to the digester building. Digesters are filled through tripper and chip chute arrangement.

Eight new digesters, 12-ft. diameter by 46 ft. high by 2-in. nominal wall thickness, were added. The digesters are equipped with hydraulically-operated digester blow valves.

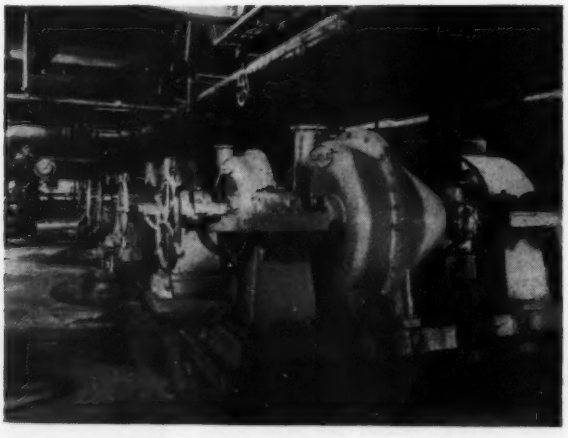
View of five new Chicago Bridge & Iron chip silos and Link-Belt chip conveyors.



One of the new Chicago Bridge digesters and 3406-S Yarway hydraulically-operated blow valve.

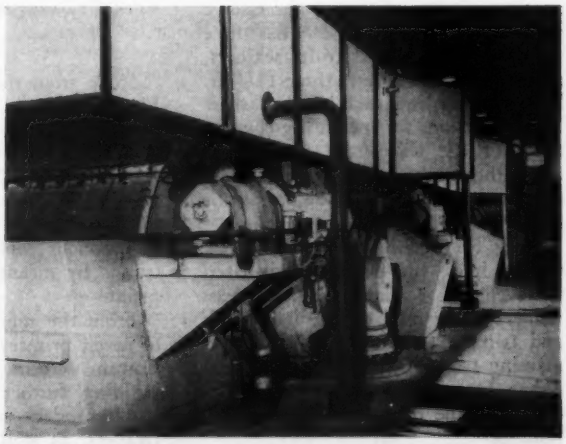


An Eriez permanent non-electric magnetic separator installed on the brown stock lines between the blow tank and the washers.



View of seven Emerson Claflin refiners in which stock is defiberized prior to going to the brown stock washer lines.

Three of the Impco brown stock washers covered by Ross hood in the three-line, three-stage washing operation.



Tending aisle for the 11½- × 16-ft. Impco top liner stock washers with instrument panels and remote-operated valves.

Four of the nine E. D. Jones double-disk refiners, used in the secondary system, are equipped with stainless steel disks and are automatically controlled.

The Impco 11½- × 20-ft. decker-saveall with stainless steel headbox serves the dual purpose of a saveall on white water return and as a decker on stock.

The digesters are operated on the direct cooking method with a natural circulation system. Digester operation is controlled with pneumatic control instruments and control valves.

The digester heat and turpentine recovery system consists of a blow steam condenser, accumulator tank, turpentine condenser, decanter, circulating pumps and regulating equipment.

The blow tanks, equipped with agitators, are 24 ft. in diameter and 68½ ft. high.

Brown stock washing

An interesting feature of the brown stock lines between the blow tanks and the washers is the permanent non-electric magnetic separators that protect refining equipment and pumps from damage caused by stray iron. There are four sets of double-row 3-in. super power magnets in a special "Y" housing so designed that the magnets can be cleaned periodically when the line is shut off.

The brown stock washing operation consists of three lines of three-stage washers as follows—Line A has three 11½-ft. diameter by 16-ft. washers, and Lines B and C have three 11½-ft. by 20-ft. washers each. The washers have provisions for measuring conductivity of the third-stage filtrate and using these conductivity values to set the third-stage shower flow automatically.

Prior to reaching the brown stock washer lines, the pulp is defiberized in seven No. 3 Claflin refiners, three refiners being used on the base stock and two on top liner stock. The remaining two Claflins may be used on either base stock or as pre-refiners preparing the base stock for the disc refiners.

Stock from the top liner washing Line "A" is discharged to a Semtile midfeather chest equipped with horizontal propeller-type agitators. From here it can be pumped either to the No. 1 mill or to two 440F 44-in. disk pressure refiners driven by 600-hp synchronous motors.

Two Goulds 8L × 16 - 20 stock pumps are installed between chest and primary refiners.

Stock from the base stock washing Lines "B" and "C" is discharged to another Semtile midfeather chest equipped with horizontal propeller-type agitators. From this chest it is pumped to three No. 440F 44-in. disk pressure refiners driven by six 600-hp synchronous motors. Stock flow control is by means of a magnetic flow meter.

From the refiners stock is pumped to seven primary and three secondary Cowan screens. The screen room building further houses 10 primary, two secondary and one tertiary stage cleaners, as well as a 40-in. double-disk refiner equipped with screw feeder and drainer conveyor. There are three deckers, one 11½-ft. diameter by 16 ft. and two 11½-ft. diameter by 20 ft. These are rotary deckers, the discharge from which is handled through screw conveyors to 30-in. 250-fpm belt conveyors, which in turn discharge through 42-in. 200-fpm belt conveyors to five 30-ft. diameter by 48-ft. tile-lined high-density tanks (two tanks are for liner pine and three tanks for base stock). Agitation in these chests is provided by swing nozzles, circulators, etc. Stock from the high-density tanks is pumped to the stock preparation area.

Stock preparation

The basement floor of the new stock preparation building houses primary and secondary machine chests; the primary high-yield, secondary soft pine, secondary hardwood refiner chests; white water pit, pumps and agitators. On the operating floor of the stock preparation building are located the primary and secondary refiners, saveall-decker and deckers.

Minneapolis-Honeywell third-stage shower control valve (top) and dilution control valve (near floor) on brown stock washers.

The nine 42-in. double-disk refiners, each driven by 600-hp synchronous motor equipped with a special sleeve bearing to withstand the momentary occasional end-thrust characteristic in this application, are arranged in a primary refining system, in which five refiners operate in parallel and a secondary system in which four refiners operate in parallel or in series-parallel. The five primary refiners are fed from a primary stock refiner chest approximately 850 tons per day of 4.5-consistency pine kraft stock. This stock is delivered under 50-lb. pressure through magnetic flow meters.

The principal stock to the refiners passes through a size No. 4 pipeline-type consistency regulator. This is the largest consistency regulator in use capable of handling up to 9000 or 10,000 gpm.

Each refiner is equipped with indicating kw meters, and stock refining is completely centralized in fully-instrumented console cabinets. The stock is discharged from the refiners under pressure and controlled with an automatic hydraulic valve on the outlet of each refiner.

The four secondary refiners are fed by pump from a tile mixing tank measuring 6 ft. in diameter and 18 ft. high and equipped with a vertical mixing agitator. Each secondary refiner is equipped with four specially-designed stainless steel disks and has the same controls as the primary refiners. Softwood pine or hardwood furnish is supplied to the mixing tank separately or as a controlled mixture. The furnish is proportioned by the use of magnetic flow meters, which act upon variable speed couplings on the stock pumps from the hardwood and/or pine supply chests.

There are five magnetic flow meters for use in the stock blending system to control the flow of various furnishes of stock to the double-disk refiners.

Immediately ahead of the magnetic flow meters there are three pipeline-type consistency regulators in the stock proportioning system. The use of a pipeline-type consistency regulator eliminates the need for stuff boxes. One of the pipeline-type consistency regulators handles the hardwood stock

(Continued on page 919)

Principal equipment installed at the St. Regis mill

Wood-handling

Bark conveyors (4), two chain and two belt conveyors .. Link-Belt Co.
Barking drums (2), 12-ft. × 67½-ft., L. M-Bar, chain-suspended, each driven by a 150-hp and a 75-hp motor ..... Fibre Making Processes Inc.
Bark shredders (2), 42-in. × 72-in. ..... Gruendler Crusher & Pulverizer Co.
Car shake out ..... Hewitt-Robbins Inc.
Chippers (2), 104-in. 10-knife, each driven by a 1000-hp Westinghouse motor ..... D. J. Murray Mfg. Co.
Chip conveyors (6), 48-in. wide belt conveyors ..... Link-Belt Co.
Chip silos (5), 42-ft. × 65-ft. ..... Chicago Bridge & Iron Co.
Cranes, crawler (2), 3900-B, with Mack one-cord orange peel grapple ..... Manitowoc Engineering Corp.
Crane (1), Lorain, 17½-ton, rubber tire-mounted ..... Finn Machinery Co.
Crane trolley, 15-ton ..... Ederer Engineering Co.
Flume pumps (2), 16,000-gpm, driven by 100-hp motors ..... Worthington Corp.
Flume screen (1), grit and traveling for solid and bark removal ..... Link-Belt Co.
High-pressure shower pump (1), driven by 75-hp motor ..... Goulds Pumps Inc.
Log conveyors (6), belt conveyors, single-, double- and three-strand chain conveyors ..... Link-Belt Co.
Rotary plate feeders (5), 17-ft. diameter, 15,000-cu. ft./hr. capacity ..... Link-Belt Co.
Trippers ..... Link-Belt Co.
Weightometer ..... Merrick Scale Mfg. Co.

Digesters

Blow tank, 24-ft. diam. × 68½ ft. ..... Chicago Bridge & Iron Co.
Blow tank agitators ..... Improved Machinery Inc.
Conveyor, 48-in. belt for digester filling with tripper and chip chute ..... Link-Belt Co.
Digesters (8), 14-ft. diam. × 46 ft. high, 4000-cu. ft. capacity ..... Chicago Bridge & Iron Co.
Digester blow valves (8), Yarway, hydraulically-operated ..... Yarnall-Waring Co.
Digester control ..... Mason-Neilan Div., Worthington Corp.
Digester heat and turpentine recovery system ..... Foster Wheeler Corp.
Valves, Nordstrom (38) ..... Rockwell Mfg. Co.

Brown stock washing

Agitators for stock tanks ..... Improved Machinery Inc.
Belt conveyors, 30-in. and 42-in. wide ..... Link-Belt Co.
Claflins (7), No. 3, 300-400 hp. .... Emerson Mfg. Co. Div., J. W. Bolton & Sons Inc.
Cleaners (13, 10 primary, two secondary, one tertiary ..... Bauer Bros. Co.
Consistency regulators (2) ..... De Zurik Corp.
Control instruments ..... Foxboro Co.
Control instruments, on brown stock washers including conductivity measurements on third-stage shower flow ..... Minneapolis-Honeywell Regulator Co.
Cowan screens (10), seven primary and three secondary ..... Montague Machine Co.
Deckers (3), one 11½ × 16 ft., two 11½ × 20 ft., rotary ..... Improved Machinery Inc.
Double-disk refiner (1), 40-in., with screen feeder and drainer conveyor ..... E. D. Jones & Sons Co.
Filtrate tanks (5), horizontally-suspended ..... Chicago Bridge & Iron Co.
Foam tank, with Impco foam breaker .... Chicago Bridge & Iron Co.
High-density stock tanks, tile-lined .... Stebbins Engineering & Mfg. Co.
Magnets, for brown stock line ..... Eriez Mfg. Co.
Magnetic flow meters ..... Foxboro Co.
Motors, electric ..... General Electric Co.
Pumps ..... Allis-Chalmers Mfg. Co.
Pumps ..... Goulds Pumps Inc.
Refiners (5), disk pressure, 440F-44-in., driven by 600-hp motors ..... Bauer Bros. Co.
Stock chests, Sentile, with Impco agitators ..... Stebbins Engineering & Mfg. Co.
Stock pumps (discharge from high-density storage) ..... Allis-Chalmers Mfg. Co.
Stock pumps ..... Ingersoll-Rand Co.
Washers (9), three 11½ × 16 ft., and six 11½ × 20 ft., arranged in a 3-stage system ..... Improved Machinery Inc.

Stock preparation

Agitators, for stock tanks and chests ..... Improved Machinery Inc.
Alum pump ..... Duriron Co. Inc.
Consistency regulators (12), including the No. 4 pipeline type capable of handling 10,000 gpm ..... De Zurik Corp.
Crane, twin box girder design ..... Ederer Engineering Co.
Deckers (2), valveless, 6½ × 12 ft. ..... Improved Machinery Inc.
Decker-saveall (1), 11½ × 20 ft., with stainless steel headbox ..... Improved Machinery Inc.
Double-disk refiners (9), with stainless steel discs, driven by G.E. 600-hp motors ..... E. D. Jones & Sons Co.
Jordan (1), No. 6 Miami, for broke refining, driven by 400-hp G.E. Motor ..... Black-Clawson Co.
Magnetic flow meters ..... Foxboro Co.
Motors, electric ..... General Electric Co.
Flowrator meters (8), for metering resin size to the mixing tank, machine chests, stock chests, etc.; and alum to secondary machine chest ..... Fischer & Porter Co.
Rosin emulsifier ..... Hercules Powder Co.
Starch filters, PM Auto-Klean type ..... Cuno Engineering Corp.
Stock chests, tile-lined ..... Stebbins Engineering & Mfg. Co.
Stock proportioning system ..... Foxboro Co.
Stock pumps ..... Goulds Pumps Inc.
Stock pumps ..... Allis-Chalmers Mfg. Co.
Stock pumps ..... Ingersoll-Rand Co.

Fig. 1—Operator adds raw starch to slurry tank of Corn Products continuous starch cooker.

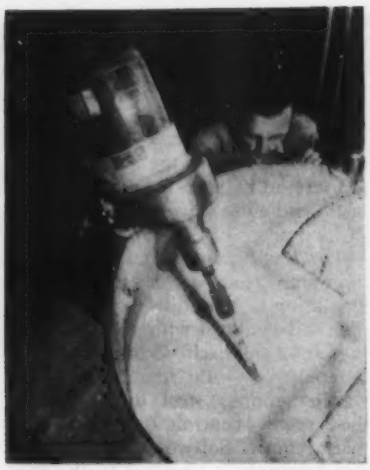


Fig. 2—View of slurry tank with feeding screen moved aside. The screen simplifies the loading of the starch and eliminates lumping.

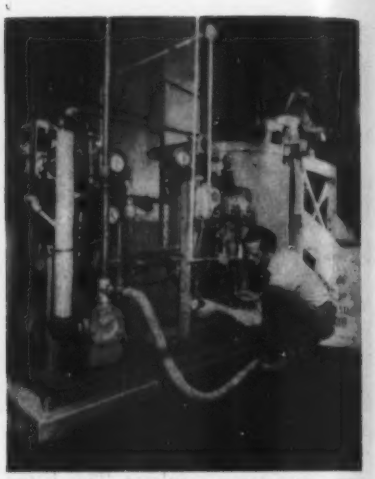


Fig. 3—Operator adjusts the Milton Roy pump, which determines the rate of addition of starch.

Cornell Paperboard Products Co. uses new method of starch addition

CLAUDE H. FLETCHER
Paper Industry Technical Representative
Corn Products Sales Co.

Selective application of starch by the continuous cooker at the top liner vat improves quality and cuts costs at Cornell Paper mill

CORNELL PAPERBOARD PRODUCTS CO. at Cornell, Wis., installed the continuous starch cooker supplied by Corn Products Refining Co. with the objective of getting more efficient utilization of the starch furnish, reducing usage and lowering costs. The initial trial runs of an experimental unit not only confirmed the expected results but additional benefits were realized and indicated from the continuous feeding of pre-cooked material.

As a result of the successful operation of this experimental unit, Cornell is currently installing a permanent unit of enlarged capacity.

In the conventional furnishing of starch through addition at the beater, all of the stock in the system must necessarily contain the same amount of starch. When this stock is the liner for a cylinder machine, starch is being supplied equally to two or more vats. In beater addition to paperboard, the primary value of starch is for control of fuzz and fiber picking in the presses and at the calenders. Addition of starch to a single vat holding the liner stock that forms the outside surface will accomplish this; so that addition of starch to the other cylinders becomes superfluous.

Accordingly, the experimental unit was installed to add starch only to the cylinder on which the outside layer of the top liner is formed. This approach was indicated by the wide variety of quality paperboard products made at Cornell that require freedom from fuzz and surfaces suitable for modern printing.

Cornell's products

The Cornell mill with its two eight-cylinder board machines is a large producer of specialty products, as well as regular grades of folding boxboard. Board grades manufactured include a full range of pulp boards such as solid bleached, single- and double-lined solid manilas, solid manilas; plain, coated and bleached line solid wood pulp boards. Grades incorporating waste paper fillers are the customary patent coated, bleached manila and other pulp-lined boxboards. Machine clay coating is applied to some of these folding boxboard grades, as well as to some of the pulp grades. These products are used in the packaging of beverages, bakery goods, dairy products, meat, candy, gum, clothing, stationery and

manufactured goods of all types.

The Cornell mill makes its own groundwood, and with its excellent facilities for preparing chemical pulp and waste paper fiber it is able to make various grades of paperboard to exacting specifications. Much of the production of the mill is tailored to individual customer needs.

Beater additions found wasteful

The increasing demand for production of higher quality board requires continuing attention to the control of fuzzing and ply-bonding. The customary means of controlling this condition included the addition of raw pearl starch directly to the beaters in amounts up to 4 per cent. This starch was used only in the liner stocks, but even then part of the starch added to the stock was being wasted.

It was recognized that this type of addition was inefficient and costly. However, until the development of the Corn Products cooking unit no suitable means had been found to significantly change the starch addition method. Retention was poor, since the small size of the starch granules allowed most of the starch to pass through the forming sheet and the wire. Control was somewhat inadequate, since, once the beaters were dropped, no change could be made until the next beater was ready. This meant a delay in getting a significant change in the stock to the board machines.

Cornell's chemist theorized that the greatest benefits would come if the starch granules were swollen to their maximum size but not broken. Subsequent work with the Corn Products cooker proved the theory right. At the point of maximum swelling the greatest retention and the greatest benefits were obtained. If the starch granule is cooked to the bursting point, the starch is lost on the wire and so are the benefits.

Description of the new starch cooker

Corn Products' starch cooker consists basically of a positive-displacement variable-rate pump combined with a water flow-rate regulator, a temperature regulator and a high-pressure hydro-heater. A cooked starch storage tank is unnecessary because the new unit can continuously prepare and deliver any specified quantity of starch needed by the paper machine.

Heart of the system is the hydro-heater that mixes steam and the fixed concentration starch slurry. Steam pressure and temperature regulators at the heater allow precise control of cooking temperatures.

The cooked starch from the heater is diluted with cold water and pumped to the paper machine. Purpose of this dilution is to minimize any further swelling that might occur if the cooked starch were not cooled immediately.

Thus, controls designed into the unit permit adding starch to the furnish under variable but specific conditions of cooking temperature, concentration and addition rate. This makes practical prompt changes in cooking conditions or formulations as required, regardless of the grade of paper manufactured.

The simplicity of the new unit may be seen from a glance at Figs. 1-5.

Starch addition ahead of the fan pump

The cooker was installed to continuously discharge the slurry to the stock immediately ahead of the fan pump. This gave good mixing and allowed changes to be made completely in a matter of about 2 min. The cooker itself was quickly adjustable to deliver from 10 to 240 lb. starch per hour when working with a slurry of 3 lb. of starch per gallon.

Since this was an experimental unit, the slurry tank held only 100 gal. This was enough for about 4 hours operation under normal usage, so an around-the-clock check was established to keep an adequate supply on hand.

The degree of cooking could quickly be adjusted, and in normal operation the control was found to be very steady. A flash cook at 185°F gave the desired swelling. Although the controls normally held the temperature within 1 degree, it was found that a range of about 180-188°F would deliver an acceptable slurry.

Mill personnel's reaction to the new method

Reaction of the plant personnel to the continuous starch cooker has been uniformly favorable.

"With the starch cooker", Mill Superintendent John Kotryck said recently, "we can reduce jordaning and still keep a good bond. This makes

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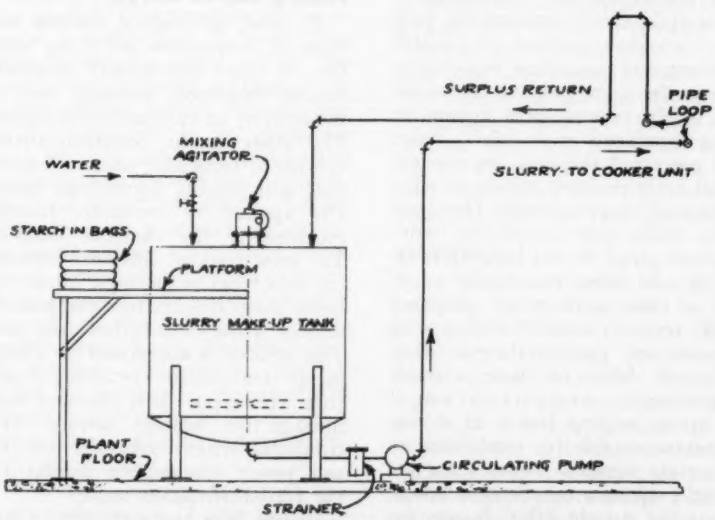

Fig. 4—Diagrammatic outline of starch-mixing station.

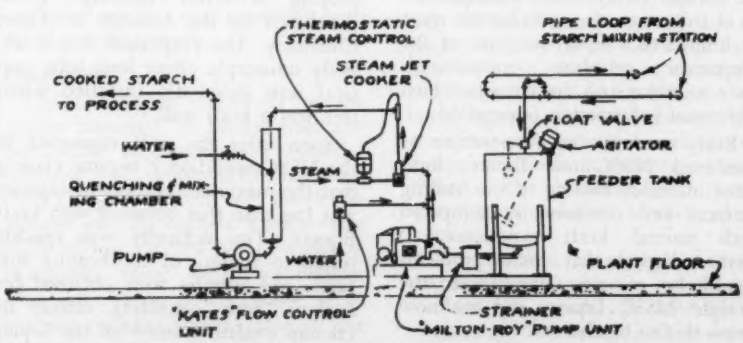

Fig. 5—Diagrammatic outline of the continuous starch cooker.

Evaporation of NSSC spent liquor*

WILLIAM G. DEDERT and J. N. BROWN
Swenson Evaporator Co.

▶ Fouling of heating surfaces can be satisfactorily solved by the use of either the long-tube vertical or the forced-circulation evaporator.

THE INCREASING PRODUCTION of neutral sulfite semichemical pulp has intensified interest in suitable processes and equipment required to recover the spent pulping chemicals. Part of the present spent liquors are being combined with kraft liquor and processed through the conventional kraft recovery system in what is termed cross-recovery. However, many mills now producing semichemical pulps do not have kraft recovery and must necessarily adopt one of the existing or proposed NSSC recovery systems if they wish to reuse any part of their cooking chemicals. Most of these recovery cycles require evaporation of the spent pulping liquor to a concentration suitable for combustion in a recovery furnace. Today there are several evaporator installations concentrating the straight NSSC liquors for these recovery cycles. Some of these are comparatively recent installations, so at this stage our contribution must be limited to a report on some of the evaporator problems encountered, their solutions and the areas in which additional information is required.

Early work in the evaporation of combined NSSC-kraft liquors indicated increased fouling of the heating surfaces and corrosion as compared with normal kraft experience. It seemed logical that these problems would be more severe with the straight NSSC liquor, and we now know this to be the case.

*Presented at the Sixth Annual Pulp & Paper Conference, University of Florida.

Fouling can be solved

To meet the fouling problem two types of evaporators are being used. One is the conventional long-tube vertical evaporator normally used in the recovery of kraft and soda liquors. The other is the forced-circulation evaporator frequently used to concentrate acid pulping liquors and generally applied to overcome fouling problems in the chemical industry. The most obvious difference between the two types is the high liquor velocity maintained across the heating surface of the forced-circulation unit. This velocity is maintained by a large pump continuously circulating liquor from the vapor flash chamber back through the heating surface. This circulating system makes the first cost and power consumption greater for the forced-circulation units.

In late 1953 and early 1954 a mill began recovery of NSSC liquor employing a direct sulfiting system developed by the Institute of Paper Chemistry. The evaporator was a six-body quintuple effect long-tube vertical unit originally installed when this was a kraft mill.

Soon after the mill converted to the NSSC operation it became evident that the maximum evaporator capacity was less than that obtained with kraft liquors. The difficulty was quickly traced to fouling of the heating surfaces, and samples were obtained for analysis. Scale consisting mainly of calcium oxalate formed on the liquor side of the tubes in the low-temperature effects. The liquor side of the tubes in the high-temperature effects was scaled with calcium carbonate, calcium sulfate and calcium sulfite. All of the scales tested contained about 15 to 20 per cent organic matter. Calcium enters the system with the wood, and the degree of barking practiced might influence the amount of scale encountered.

To maintain production it was necessary to make frequent chemical cleanings of the heating surface. In time these cleaning procedures were improved so that downtime was reduced and the over-all evaporator capacity increased. Stainless steel tubes were installed in all effects to minimize the tendency for tube fouling to replace the original steel tubes, which were showing definite signs of corrosion.

As a result of the above and generally improved operating technique with the entire recovery cycle, the LTV evaporator successfully concentrated the NSSC liquor to a discharge of about 45 per cent total solids. Its capacity was still somewhat less than obtained with kraft liquors, but the operating problems and costs due to scaling of the heating surface had been brought under control.

Later this same mill installed a forced-circulation first effect to form a sextuple-effect evaporator. The forced circulation addition provided increased evaporative capacity, increased total solids discharge and decreased steam consumption.

In 1954 a test program on NSSC evaporation was conducted by the In-

stitute of Paper Chemistry in its facilities at Appleton, Wis. The test work was performed in a forced-circulation evaporator of sufficient capacity to provide reliable heat transfer data and demonstrate scaling tendencies. Feed liquor was obtained from a mill recovering NSSC liquor by the direct sulfiting method. Conditions were varied to simulate operation of individual effects of a multiple-effect evaporator.

The tests demonstrated that this type of forced-circulation evaporator could be used to concentrate this particular NSSC liquor to 60 per cent total solids without scale forming on the heating surfaces.

Two different approaches with high-concentration liquor

The Institute also investigated some of the physical properties of the NSSC liquor. It was noted that high-concentration liquors tend to solidify to a gel that can be made fluid again with sufficient agitation. This property—termed thixotropy—makes it difficult to establish liquor viscosities at high concentrations. The effect upon evaporator design is considerable. Normally, a change in the circulation rate will affect the heat transfer coefficient because of changed liquor film velocity. With thixotropic liquor the coefficient will also change because of the change in apparent viscosity due to the difference in agitation.

This suggests two approaches to the design of a high-concentration effect. Providing a high rate of circulation assures liquor flow in the turbulent region with predictable high heat transfer coefficients. This means small heating surface requirements but high power demand. Providing a low rate of circulation results in liquor flow in the transition or streamline zone with low heat transfer coefficients expected. This requires much more heat transfer surface, but there would be a power saving if the change in viscosity was not too great. The choice of design would be governed by factors of cost and power availability.

The Bradley recovery system

In 1953 a mill-size pilot run was conducted on the Bradley recovery system. The Bradley system is designed to convert a sodium base sulfite or NSSC liquor to a liquor that is chemically similar to kraft. This would permit handling in the usual kraft recovery equipment.

A combination of long-tube vertical and forced-circulation units was installed in the evaporator pilot plant. The forced-circulation unit was required to concentrate the liquor to the desired 65 per cent total solids, which is beyond the ability of a long-tube vertical unit.

To obtain satisfactory operation certain conditions had to be provided. At 65 per cent total solids the liquor apparently polymerized to a very heavy syrup. Storage between the evaporator and recovery furnace had to be made at not over 45 per cent total solids with final concentration to 65 per cent total solids followed immediately by burning.

The presence of wood calcium resulted in a soft scale of calcium sulfite and the precipitation of considerable quantities of solid phase calcium lignosulfonate. Both of these problems and a comparable insolubility of organic sodium compounds were corrected by the addition of sodium carbonate and adjustment of the feed liquor to a minimum pH of 10.8 When handled in this manner the liquor was successfully concentrated to 65 per cent total solids.

The Mead recovery system

In 1955 an NSSC recovery system employing the Mead recovery cycle was erected. To concentrate the spent liquor a triple-effect all-forced-circulation evaporator was installed. The decision to use forced circulation was based on three points. First, because of the small size of the evaporator there was little difference in price and operating cost between forced-circulation and long-tube vertical. Second, plant operating personnel was not experienced with the operation of evaporators, so the reduced scaling problems to be expected with forced-circulation evaporators would avoid operating complications. Third, the Mead process involves a carbonation step followed by sulfiting as compared with the direct sulfiting method upon which our previous long-tube vertical experience was obtained.

The heat transfer data and nonscaling tendencies of the forced-circulation evaporator demonstrated at the Institute of Paper Chemistry were confirmed on this unit operating with Mead process liquors.

Corrosion

Opinion varies widely as to the proper materials of construction and fabrication techniques to withstand corrosion in evaporators handling NSSC liquors. Much of the background on this subject comes from mills having handled NSSC liquor in equipment other than evaporators. This information is a valuable guide but not necessarily applicable to the evaporators. More complete data are being gathered by installing test corrosion spools in the existing evaporators, and this program will be extended to the evaporators now being fabricated. To be reliable these test spools must be subjected to the operating conditions for some time; so the results of this work are not available.

All short-period tests and mill experiences have indicated that the water vapor from NSSC liquors is more corrosive than the liquor itself. This is attributed to the hydrogen sulfide released from the liquor at the low pH level. Some of the corrosion tests indicate that Type 304 stainless steel is as resistant as Type 316 stainless steel. However, a number of the mills have reported failures with Type 304 stainless that were cured by converting to Type 316. There have also been reports of failures of both Type 304 and Type 316 stainless steel due to corrosion adjacent to the welds resulting from carbide precipitation during welding. This can be avoided through use of extra-low carbon stainless steels.

Most of the new NSSC evaporators have been fabricated of a combination of mild steel and stainless steel. In general, parts of the evaporator that would be difficult to replace or repair have been fabricated of stainless steel. This refers particularly to the heating element shells on all but the first effect and the tubes and tubesheets of all effects. Where stainless steel has been used, the choice has been between Type 304 ELC and Type 316 ELC.

Summary

An increasing number of mills are installing NSSC evaporators as part of an NSSC recovery cycle. Some mills now practicing cross-recovery would prefer to handle the NSSC liquor in a separate evaporator to avoid the detrimental effects of the mixed liquors in kraft evaporators.

Construction and testing of a number of NSSC evaporators has provided reliable data upon which to base future installations. The main problem — fouling of the heating surfaces — can be satisfactorily solved by the proper application of either the long-tube vertical or forced-circulation evaporator. The choice between the two is based on economic factors, such as capital and operating costs, desired liquor discharge concentration and ability of the operating force to cope with periodic surface cleaning problems.

The problem of corrosion of the evaporator equipment is not as well resolved. A variety of materials of construction are being used, and only time will demonstrate the correct course.

Behavior of various dyestuffs toward deinking chemicals

RALPH W. KUMLER

A quick reference guide showing the color fastness of dyestuffs to such chemicals as alkalis, hypochlorite, peroxide and hydrosulfite.

THE DESIRABILITY of having a quick reference guide to the deinkability of various dyestuffs is obvious. It would be helpful to the manufacturers of colored paper who have consideration for the problems that arise in the reuse of paper as raw material. Some manufacturers of colored paper now insist that the dyes supplied be destructible in order that colored broke may be reworked into any grade that may be in process. This eliminates the necessity of carrying large stocks of broke of various colors waiting to be reworked into subsequent manufacture of grades of the same colors. Of equal importance is the use of colored paper purchased through regular waste paper channels. Manufacturers of colored paper can avoid an economic loss to the industry as a whole by turning out products capable of reuse.

While much information on the properties of dyestuffs is available from dyestuff manufacturers, such information has been established for the purpose of determining the behavior of these products in the actual use of paper, rather than for showing how they may be destroyed. There is considerable information on "fastness". Lack of this property may mean that, under exposure to certain chemical or physical conditions, the dyestuff is destroyed. In many cases, however, it really means that only the shade is altered. Some information is available to distinguish between the two properties but not for all products.

In some cases a given chemical treatment may partially remove the dyestuff but not completely. In other cases a mild treatment does not destroy the dyestuff, whereas a drastic application may do so. In setting up the tabulation it has been necessary to indicate such properties by stating that resistance to a given chemical is "fair".

In all cases data refer to the effect of a single chemical. A series of treatments, such as the alkali cook followed by oxidant bleaching given in a deinking process, may produce results other than what would be expected from the observation of the effect of separate applications.

Color index numbers

The reference works on dyestuffs lists thousands of products. Fortunately, only about 100 basic compounds are commonly used in the coloring of paper. Since it is not practical to list all the trade names by various manufacturers, the dyestuffs in this report are identified by color index number. A color index number identifies a chemical base, which is the same for all manufacturers. No doubt there are variations in the products of different manufacturers bearing the same color index, but it would be expected that all would exhibit approximately the same behavior toward deinking chemicals.

TAPPI data sheets 136, 137 and 138 give a listing of trade names of American dyestuffs, along with the color index numbers. By referring to these data sheets it is possible to determine the color index number of any given dyestuff; or if the index number is known, a list of most products having this number may be readily obtained.

Some dyestuffs bear Prototype (.Pr) numbers. This means that while they have not been assigned color index numbers, foreign prototypes are on the market. Some dyestuffs have not been assigned either color index or prototype numbers, and since these are mostly specialties or patented products they are omitted from this report.

General comments

The following general statements about deinkability of dyestuffs may serve as a general guide in the choice of products that can be destroyed at will:

1. Basic Dyes—These colors are partially destroyed by a caustic cook. They can also be reduced with zinc hydrosulfite but reoxidize on long standing. Chlorine will bleach these colors to some extent, but not fully. These dyestuffs are mainly used on unbleached papers (newsprint, kraft, boxboard, etc.).
2. Acid Dyes—These colors require size and alum for setting on the fiber and can be destroyed with a caustic soda. They will also reduce fully with zinc hydrosulfite and are destroyed by chlorine.
3. Direct Dyes—Most of these dyestuffs will strip with caustic and bleach with chlorine and hydrosulfite. However, there are exceptions, among which are the stilbene yellows and oranges, which are regarded as non-deinkable. Also, the turquoise blues cannot be destroyed or lightened by caustic soda, chlorine bleach or hydrosulfite.
4. Pigment Colors—The phosphotungstic-molybdic lakes are used primarily for tinting white papers and, therefore, do not present serious problems in deinking. Information regarding their reaction to caustic soda differs somewhat, but it is agreed that they are destroyed by hydrochlorite bleach. The chrome yellows and iron blues are destroyed by caustic, but the azoic types used in twisting tissues are not regarded as deinkable. The azoic types can be discharged by direct chlorination.

The data in the tabulation, given by dyestuff manufacturers, are based on spot tests. Alkali resistance is determined by various alkali solutions, including 2.0-per cent soda ash, 0.25-per cent caustic soda and 1.0 per cent caustic soda. Hypochlorite fastness is based on solutions of either sodium

hypochlorite or calcium hypochlorite in strengths ranging up to 0.15-per cent available chlorine. Hydrosulfite tests were carried out with solutions of 2.0 per cent zinc hydrosulfite by spotting at 150°F and allowing the drop to dry. Peroxide tests were conducted by spotting with 1.0-per cent hydrogen peroxide at room temperature and allowing to dry. It will be noted that the methods of testing are considerably different from deinking procedures, and results must be interpreted accordingly.

An arbitrary code indicating the properties has been adopted. Manufacturers' codes vary widely, and it has been necessary to translate the data supplied into the adopted code. It will be noted that the properties are expressed in a negative way, so far as the deinking manufacturer is concerned. For instance, if the fastness to alkali is good, the color is not destroyed by alkali and is, therefore, bad from the deinking standpoint. This system is used, however, as it was feared that an attempt to reverse the code might result in unreliable information.

Data on Color Fastness of Dyestuffs

Code: E—Excellent; G—Good; F—Fair; P—Poor

	Color Index	Alkali	Hypochlorite	Peroxide	Hydrosulfite
Acid Reds	PR 100		P		
	184		P		
	252	F	P		
	179	P	P	G	G
	176	F-G	P	G	G
	PR 148	G	P	F	F
	185		P		
Direct Reds	448	G	P	F	P
	PR 31	F	P		
	370	G	P		
	128	F	P		
	PR 67		P		
	353	F	P		
	PR 19	P	P		
	382	P	P		
	419		P		
	278	P	P	G	G
	326	F	P	E	E
	327	G	P		
	376	F	P	G	F
Basic Reds	678		F		
	749	F	P		
	677	F	F	G	G
	841	F	P	G	G
	752	F	P	F	F
Acid Oranges	161	G	P	F	P
	151	G	P	G	P
Direct Oranges	326	G	P	E	F
	415	F-P	P	G	F
	621	P	G	F	F
	PR 72	F	G		
	PR 73	P	G		
Basic Oranges	20	P	P	G	G
Acid Yellows	801	F	P		
	138	F-G	P	F	P
Direct Yellows	814	G	G	G	G
	PR 439	F-G	P		
	365	G	G	G	E
	PR 99	G	P		
	620	P-F	G	G	F
	PR 533		P		
	802	F	P	P	G
	PR 582	F-G	P		
	622	G	G	E	G
	364	P	P	P	P
Basic Yellows	655	F	P	G	P
Acid Greens	666	P	P	G	P
	667	P	P		
Direct Greens	593	P	P		
	PR 470	G	G		
Basic Greens	662	P	P		
	657	P	P	G	P
Acid Blues	1054	P	P	P	F
Basic Blues	922	P	P	F	F
	729	G	P		

	Color Index	Alkali	Hypochlorite	Peroxide	Hydrosulfite
Direct Blues	477	E	P	E	E
	520	F	F		
	502	P	P	G	G
	PR 26	G	P		
	518	F	P	P	G
	PR 71	P	P		
	406	F	P	G	G
	319	P	P	P	P
	PR 278	F	P	F	F
	432	G	P	G	G
Direct Violets	PR 35	P	P		
	PR 277	G	P		
	PR 366		P		
	PR 367	F	P		
	394		P		
Basic Violets	681	P	P		
	842	G	P		
	680	F	P	G	G
Acid Violets	698	P	P		
Direct Browns	596	F	P	G	G
	PR 573	G	G		
	PR 95	P	G		
	420	G	P	G	G
	PR 47		G		
	598	P	P		
Basic Browns	331	F-P	P	E	G
	332	P	F-P	G	F
Acid Blacks	246	F	P		
	865	P	P	G	G
Direct Blacks	401	G	P	G	G
	PR 96	G	P		
	531	P	P	G	G
	PR 379	F	P		
	978*	G	P		
Organic Pigments and Lakes					
Reds	PR 541	G	G		
	678	F	P		
	PR 563	F	G		
	752	G	P		
Blues	707	P	P		
	682	G	P		
	1288	P	G		
	PR 481	E	E		
	1112	G	G		
	1106	G	G		
Greens	PR 483	G	G		
	PR 149	E	P		
	662	P	G		
Violets	680	G	P		
Yellows	1270	P			

*Sulfur color

Freeness of blended sulfite and bookstock

D. S. DAVIS

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University of Alabama

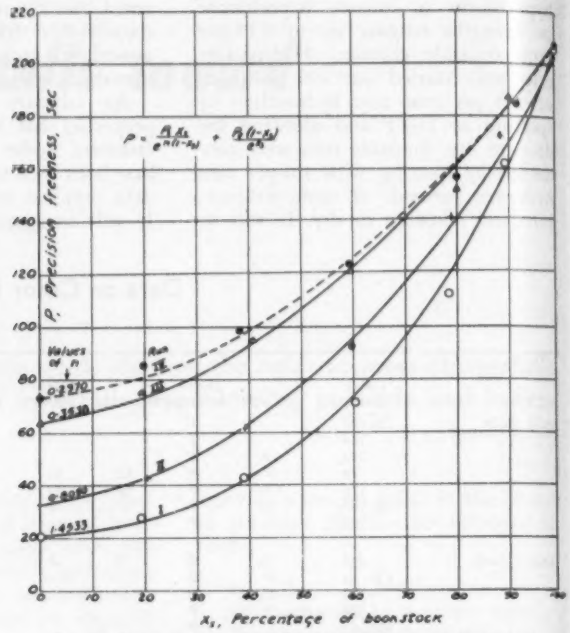

Fig. 1—Freeness values of blended sulfite and bookstock

ALL WHO MAKE freeness tests come very quickly to realize that for blended stocks freeness is not a linear function of percentage composition. Yet, in dealing with blended stocks one would like to be able to estimate the freeness of the blend from the freeness values of the components. Mixed fibers feel so differently that even when only two stocks are involved no general expression that would relate the freeness of the blend, the freeness of the free stock, the freeness of the slow stock and the percentage composition is likely to be found.

For blends of specific stocks, though, some progress has been made. Working with relatively free and very slow southern pine kraft pulps, Ayer (1) showed essentially that the logarithms of the freeness values of blended stocks were linear with percentage composition in accordance with the equation

$$P = P_s^{\,x_s} P_f^{\,(1-x_s)} \qquad (1)$$

where for the Williams Precision freeness tester P, P_s, and P_f are the freeness values in seconds for the blend, the slow stock and the free stock, respectively, and x_s is the fraction of slow stock in the blend.

To investigate the freeness of blends of sulfite and bookstock, blends in approximate bookstock percentages of 20, 40, 60, 80 and 90 were prepared. Freeness values were determined for blends and pure components at sample weights between 2.95 and 3.14 grams and at temperatures of 25.0 to 25.8° C. Most of the sample weights were between 3.01 and 3.06 grams, and most of the tests were conducted at temperatures between 25.0 and 25.2° C, so that slight errors that might arise from correction would be minimized. All freeness values were corrected to a sample weight of 3.00 grams and to a temperature of 25° C by means of well-known methods (2, 3, 4).

The data that appear in Table I and in Fig. 1 can be correlated through use of the equation

$$P = \frac{P_s\, x_s}{e^{n(1-x_s)}} + \frac{P_f\,(1-x_s)}{e^{x_s}} \qquad (2)$$

Table I—Freeness data of blended stocks

x_s Frac. slow	Run I, n = 1.4533 P Freeness obs.	P sec. calc.	% Dev.	Run II, n = 0.8050 P Freeness obs.	P sec. calc.	% Dev.
0.000	20.4	$=P_f$		32.2	$=P_f$	
0.193	27.6	25.9	−6.2	42.1	42.8	1.7
0.390	42.4	41.5	−2.1	61.0	62.2	2.0
0.603	71.0	74.0	4.2	92.7	94.8	2.3
0.784	112.2	119.6	6.6	141.0	137.8	−2.3
0.893	161.8	157.9	−2.4	172.3	166.0	−3.7
1.000	205.4	$=P_s$		202.6	$=P_s$	

x_s Frac. slow	Run III, n = 0.3538 P Freeness obs.	P sec. calc.	% Dev.	Run IV, n = 0.2970 P Freeness obs.	P sec. calc.	% Dev.
0.000	63.3	$=P_f$		73.2	$=P_f$	
0.196	75.2	72.6	−3.5	85.4	80.6	−5.6
0.407	94.8	93.9	−0.9	98.6	96.4	−2.2
0.596	120.7	121.6	0.7	123.5	125.0	1.2
0.798	152.0	160.8	5.8	156.6	164.8	5.2
0.900	187.2	183.7	−1.9	184.7	187.2	1.4
1.000	208.5	$=P_s$		207.0	$=P_s$	

where e is the base of natural logarithms. The value of n is plotted against P_f/P_s in Fig. 2 and is defined implicitly by the expression

$$1/n - 0.0162\ n^9 = 10.960 \frac{P_f}{P_s} - 0.505 \quad (3)$$

This work indicates that the freeness values of blends of sulfite and bookstock can be predicted through use of Equation 2 with an average uncertainty of about 3 per cent. This equation does not hold for Ayer's data for blended kraft stocks, nor is Equation 1 valid for the present data that deal with blends or sulfite and bookstock.

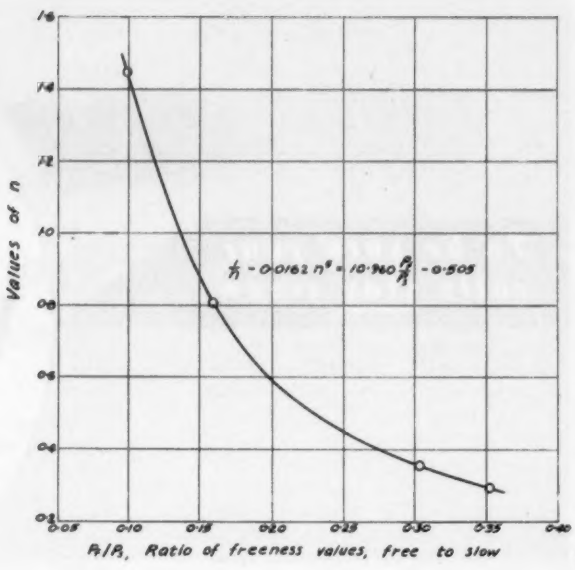

Fig. 2

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(1) Ayer, J. E., Tappi, 40 (1) '36 (1957).
(2) Davis, D. S., Paper Industry & Paper World, 25 1345 (1944).
(3) Rhodes, R. C., and Davis, D. S., Paper Industry 32 (4) 398 (1950).
(4) Worm, E. A., Jr. and Davis, D. S., Paper Trade Journal, 89 (23) 235 (1929).

New Method of Starch Addition

(Continued from page 913)

for better and more uniform quality. If our pick falls off we can bring it up almost immediately. Adjustment of rate of feed is very quick and simple."

"All in all", he added, "use of the continuous cooker gives us a better means of controlling the sheet without a furnish change, use of additional labor or unnecessary use of high-price starches or gums."

Ken M. Winrich, who as chief chemist supervised the installation and development work of the trial unit before being transferred to Cornell's Milwaukee division, expressed himself as being pleased with the operation of the cooker and the benefits that have been gained from its use. "With the continuous cooker in use", he said recently, "we find that pearl starch gives us the benefits we had formerly expected from gums."

"We originally went into the program to save money and to improve control. We did accomplish a reduction in starch usage through selective application to one liner cylinder, and we also found that we were expanding the use of starch where quality improvements were obtained."

"We get maximum retention in the web through the use of the properly swollen starch. Adjustment of the cooker to maintain the right degree of cook is a simple matter, and the settings are stable within reasonable rates of starch addition."

Because of the definite advantages found with the experimental unit, a permanent installation was designed by Cornell engineers. Based on the principles of the Corn Products unit, the new cooker will be equipped with Rotameter controls for selective addition to any or all of the liner vats on both machines simultaneously.

With controlled and independent feed of starch to all of the liner cylinders, the plant expects to gain additional benefits. The installation should improve quality on all production where starch can be a factor but without wasting any of the starch through inefficient methods.

St. Regis Mill

(Continued from page 911)

to mixing tank, and two pinpline regulators handle pine stock.

The secondary refined stock discharges to the secondary machine chest, from where it goes to the fan pump and directly to the secondary headbox.

A 11½-ft. by 20-ft. valveless filter serves the dual purpose of a saveall on white water return from the machine and as a decker for thickening stock from the base stock high-density chests. Between the discharge of this machine and the primary stock chest is a consistency regulator. Two 6½-by 12-ft. valveless deckers are used for thickening hardwood and pine stock between the high-density storage and supply chests. Consistency regulators are also located between their discharge and the supply chests. Other consistency regulators are installed in the supply lines to both the primary and secondary refiners, thus giving step control of consistency in the stock preparation system.

A No. 6 Miami jordan equipped with stainless steel filling and driven by a 400-hp synchronous motor is used to work down broke during periods when wet strength sheets are being run. It is designed for high-speed operation, is equipped with ¼-in. steel tackle in single-bar arrangement. It is installed between the broke storage chest and headbox of the saveall-decker.

Four Flowrator meters are used for metering rosin size to the mixing tank, the secondary machine chest, the primary machine chest and the primary stock chest. Four additional Flowrator meters are used for the purpose of preparing a dilute alum solution and metering it to the primary machine chest and the secondary machine chest.

The use of a homogeneous starch solution, free of lumps and solid contaminants, is assured by a number of type PM Auto-Klean filters operating on the principle of edge-type filtration. The filter element of these filters can be cleaned of all solids collected on its surface without interruption of service by merely making one complete turn of a handle.

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You can be sure of getting the *right* Doctor for *any* roll, when you come to Bird. Twelve different types of Vickery Doctor are available, each designed to do a particular job in the best way.

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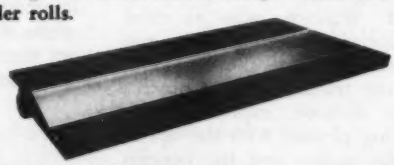
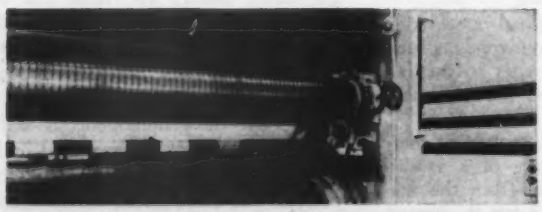
CANADIAN INGERSOLL-RAND CO., Limited, Montreal

VICKERY HI-ANGLE DOCTORS combine light pressure with extraordinary cleaning efficiency. They are *leak-proof.*

VICKERY HI-FLEX DOCTORS have super flexibility to assure perfect blade contact along calender and supercalender rolls.



VICKERY RS TYPE DOCTORS permit rapid blade removal and replacement even in locations where space is limited.



VICKERY MOTOR OR HYDRAULICALLY OSCILLATED DOCTORS assure maximum operating efficiency wherever oscillation is indicated. Oscillating mechanism involves no installation problems.

VICKERY AIR LIFT is readily applied so that each individual Doctor or all Doctors at once may be lifted from the rolls at a touch of a lever.

CURRENT COMMENTS

An absence in the lexicon . . . 1957 in review . . . and mergers continue

by WARREN B. BULLOCK

"Recession" is a word that has been excised from the lexicon of the American paper industry. The top brass of the industry when they foregather in mid-February for the annual Paper Week will describe the business conditions of the year just closed as an "economic readjustment" to make output meet the demands of the consuming public. They know that capacity increased materially in the year 1957; and that, while profits have narrowed, the production was only slightly below the previously high record established in 1956.

Some features of the year 1957 to be reviewed by industry experts are:

1. Projected increases in capacity were either abandoned or deferred to a total of 5,000,000 annual tons of paper and paperboard.

2. Increasing costs reduced profits by a total of about 18 per cent, the most precise figures available being a total net earnings of $540,000,000 as against a previous year total of $657,000,000. Only one major company, however, reduced its dividends, and that was to conserve funds for placement in expansion.

3. Despite a cut-back in projected increases in capacity, there was an actual increase in total capacity to 34,100,000 tons, as against capacity of 31,900,000 tons in 1956.

4. Higher prices, while not compensating fully for the increased costs of production, were not inconsiderable, the total dollar sales volume being 10.6 billion dollars, compared with 10.69 billion in 1956. The rectification of the price situation is shown by the fact that the October price index of wholesale prices of paper, paperboard and allied products was 1.8 per cent higher than in January.

5. Actual output in 1957, according to latest estimates, was 30,700,000 tons, only 2.3 per cent under the previous high record of 31,428,000 tons in 1956. The heaviest reduction was in the paper field, rather than in paperboard. Paperboard output of approximately 17,000,000 tons exceeded paper production, which totaled 13,700,000 tons.

6. Increased consumption of newsprint rose sharply in 1957 to a total of 11 per cent over 1956, but the areas where customer usage is still to be brought back to normal is most pronounced in the coarse paper field and in that for printing papers (such as magazines and books) other than newsprint. Meanwhile the paperboard group is driving forward faster than paper.

7. Consumption of inventories as well as direct consumption is chargeable to the reduced output, but a replenishment of these inventories would bring deliveries back to a high figure.

Available: money for expansion

That the public can be expected to continue furnishing funds for industry development is shown by recent announcements of prospective loan flotations by various companies. Included is a projected issue of $40,000,000 in 25-year debentures of West Virginia Pulp & Paper for a long-range construction program already underway. Kimberly-Clark has registered with the Securities & Exchange Commission a proposed offering to the public of $30,000,000 in 25-year sinking fund debentures. American Israeli Paper Mills, headed by Joseph Mazer, who is also treasurer of Hudson Pulp & Paper, is offering 6,000,000 shares of common stock for the further development of the paper industry in Israel. Brunswick Pulp & Paper has placed $3,145,000 in 5½-per cent notes with New York Life Insurance Co.

Once again the 40-year-old battle of the publishers against the newsprint manufacturers has been renewed. The United States Department of Justice has put the FBI at work investigating the activities of United States companies that control Canadian mills to determine whether the anti-trust laws have been violated. This government has been unable to apply the anti-trust laws against the Canadian companies. Now the target is American capital invested abroad. If no ground is found for prosecution of the American companies, the Department of Justice is still required to file a quarterly report on conditions under the Defense Production Act.

This investigation comes at a time when United States mills are rapidly taking over a larger part of the domestic newsprint market. United States production in 1957 was better than 10 per cent above that of 1956, and new tonnage is steadily coming into the field. Canada, however, anticipates a cut-back of about 4 per cent in 1958 from its 1957 production levels. Production, after 16 years of oppression and war, has caught up with the shortages, according to R. M. Fowler, president of the Canadian Pulp & Paper Association. Mr. Fowler also says that (including United States production) the newsprint industry is likely to have surplus capacity in the immediate and foreseeable future.

The FTC goes West

Crown Zellerbach has announced it will oppose in court the order of the Federal Trade Commission that it divest itself of St. Helens Pulp & Paper Co. The order is under the Clayton Act, which forbids a corporation to acquire stock in another corporation where the affect may be to damage competition or create a monopoly in any line of commerce. Crown Zellerbach exchanged $9,500,000 of its stock in 1953 for shares of St. Helens, and two years later St. Helens was fully merged into Crown Zellerbach. A prelimi-

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Current Comments . . .

nary finding by a government examiner filed in February 1957 said that Crown Zellerbach itself produced 5½ per cent of the total coarse paper made in the 11-state West Coast area; and St. Helens produced 11 per cent, thus giving the present Crown Zellerbach a clearly predominate share of that market. The Federal Trade Commission overruled the Crown Zellerbach claim that the examiner's report was too restrictive in the use of 11 states as a guide basis for the claim of restriction of competition.

Crown Zellerbach goes East

Meanwhile, Crown Zellerbach is asking approval of the Newfoundland legislature of its proposal to establish a big pulp and paper project on the south coast of the province, hitherto accepted as a part of the Bowater paper empire.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Jan. 10, 1958	Dec. 10, 1957
American Can	42½	...
Celotex	30	27½
Same Pref.	18½	17
Certain-Teed	9¼	8¾
Champion P. & F.	*34½-35	34⅜
Same Pref.	*91-93¼	*91-92
Chesapeake	24⅜	23½
Container	17½	17¾
Same Pref.	*86¼-88	*84-86
Continental Can	41⅞	...
Crown Zellerbach	44⅜	47⅜
Same Pref.	96½	98¾
Diamond-Gardner	26⅛	...
Eastern	18½	*18¾-19⅛
Federal Paper Board	30¾	32⅛
Same Pref.	*19¼-19½	*19⅜-19⅞
Fiber Paperboard	21½	21¼
Same Pref.	*82-87	*80½-81
Great Northern	50⅝	49¼
Hammermill	22⅞	24¼
International	86¼	91⅛
Same Pref.	*91-96	92
Kimberly-Clark	47½	48¼
MacAndrews & Forbes	24	23
Masonite	27¼	25⅛
Mead	35¼	37⅛
Same Pref.	*86-89	84½
Minnesota & Ontario	22½	21⅜
Oxford Paper	26¾	28½
Same Pref.	88	86¼
Rayonier	14⅝	15¾
Riegel	21⅜	21¼
St. Regis	27⅜	28⅛
Same Pref.	91½	*87-89
Sealright	25¾	23⅜
Scott	58⅜	59¼
Same $3.40 Pref.	*78½-79½	*73½-77
Same $4 Pref.	*93-96	90-90¾
Sutherland	33⅛	33⅛
Union Bag-Camp	33¼	33¾
United Board and Carton	19	*19¾-20⅛
United Wallpaper	6¾	6⅛
Same Pref.	*13-14½	*13-15
U. S. Gypsum	65¾	60⅛
Same Pref.	*167½-170	162½
W. Va. P. & P.	37	34¼
Same Pref.	*93-99	97½

New York Stock Exchange — Bonds

A.P.W. Products 5%	76	...
Champion P & F. 3¾%	93½	...
Champion P. & F. 3%	90	95½
Mead 3%	...	...
Scott 3%	97⅛	94⅛

American Stock Exchange — Stocks

Allied	6½	6⅜
American Writing	19	18¼
Brown	10¼	10
Puget Sound	14	14

*Closing Bid and Asked Prices

Notwithstanding the Federal Trade Commission, the "urge to merge" has resulted in the acquisition by Mead Containers, a wholly owned subsidiary of the Mead Corp., of Ottawa River Paper of Toledo, producer of corrugated shipping containers and corrugated specialties for the automotive, glass and food industries in Ohio, Michigan and Indiana. Philip Boutillier Jr., president of Ottawa River, becomes a vice president of Mead.

The newspapers have been filled with paper and paperboard news during the last few weeks. Swan Finch Oil, which has a majority of the common stock of Doeskin Products, has applied to the federal courts for permission to reorganize and thus avoid bankruptcy.

The Tariff Commission has held that Masonite did not violate the Anti-Dumping Act in importing hardboard from its South African subsidiary at a time when it was unable to fill its orders from its domestic mills. The South African hardboard was not sold at cut prices, and the Commission therefore held that there was no injury to the domestic hardboard industry.

Dixie Cup, subsidiary of American Can, is analyzing the hospital market as a field for paper products from paper cups to complete table service. Other companies are considering paper clothing, such as paper operating room shirts, etc. as a prospective hospital field.

Net Incomes

Champion Paper & Fibre Co.—For the December quarter, $2,704,650; for the similar quarter a year ago, $3,677,149.

Great Northern Paper Co.—For 40 weeks ended October 6, $2,631,552; a year ago, $4,744,183.

Hudson Pulp & Paper Corp.—For the fiscal year ended August 31, $3,061,994, for the previous year, $3,513,866.

International Paper Co.—For the quarter ended September 30, $16,567,576; a year ago, $19,907,825.

KVP Co.—For the fiscal year ended September 30, $3,172,085; for the previous fiscal year, $3,677,517.

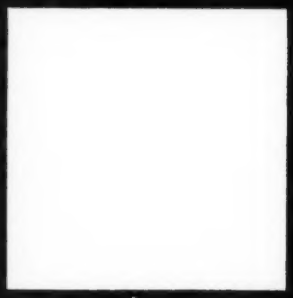
Kimberly-Clark Corp.—For the quarter ended October 31, $7,070,769; for the similar 1956 quarter, $7,230,775.

Marathon Corp.—For the fiscal year ended October 31, $8,270,841; for the previous fiscal year, $9,122,353.

St. Croix Paper Co.—For nine months ended September 30, $828,539; for the similar 1956 period, $1,190,460.

Sorg Paper Co.—For nine months ended September 30, $373,143; for a year ago, $673,164.

West Virginia Pulp & Paper Co.—For the fiscal year ended October 31, $11,968,000; for the previous year, $16,331,000.



IT'S WHITE

Bauerite groundwood type pulp from hardwoods, bleached to a new whiteness, offers new applications . . . new economies . . . new profits. Where can you use it?

The Bauerite process makes economical, high quality groundwood type pulp from softwoods, too. Send for details.

THE BAUER BROS. CO.
BURT AND SHERIDAN
SPRINGFIELD, OHIO

They'll both agree on one thing...

Systems vary, and superintendents disagree on treatments — even on the same furnish and for the same end product.

But in leading mills from one end of the country to the other (and in a good many foreign mills), whatever the furnish, whatever the end-product, whatever the system, you'll find Jones equipment — producing better stock, more efficiently and more economically.

Only Jones supplies *all* types of stock-preparation equipment . . . pulpers, beaters, conical refiners, disc refiners, agitators and screens. All types, yes . . . but only one quality — the best!

Ask your **Jones** *man first...*

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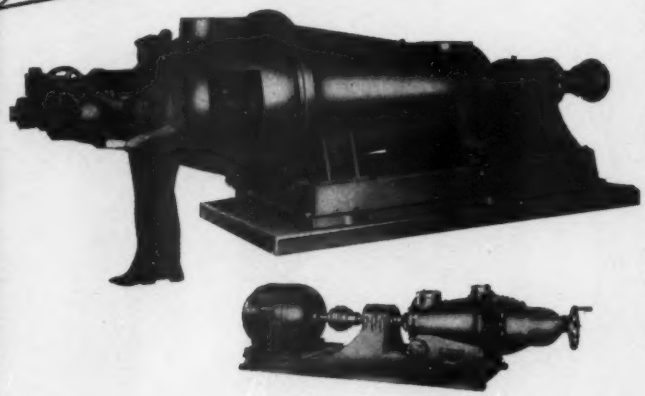
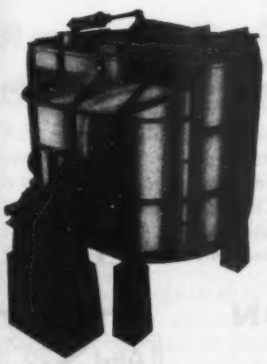
Jones JORDANS



From the mighty Leviathan down to the Midget (for specialties and laboratory work) there is a Jones Jordan for every mill need. A wide variety of tackle, and a choice — on most models — of three types of plug adjustment mechanism, give Jones Jordans the maximum of control and flexibility. Ask your Jones representative or write us for Bulletin EDJ-1007A.

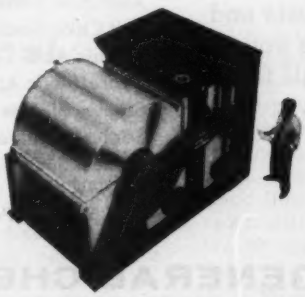
All Jones Jordans, for the past 15 years, have featured split small heads and self-contained bearings to permit quick and easy dismantling and assembly.

Jones HI-LO PULPER



Only individual rotors, one for circulating and one for defibering — the unique feature of this outstanding Jones machine — can provide fast, complete defibering, without cutting, and with the most efficient use of applied horsepower. The HI-LO is proving this in mill after mill, even on such hard-to-treat material as waste news and wet-strength broke. Ask your Jones representative for details or write for Bulletin EDJ-1063.

Jones BEATING UNITS



A complete "packaged" unit, incorporating proven principles of Jones-Bertrams design, affording precision control, more positive and uniform treatment of stock . . . and significant savings in installation, floor space, maintenance and power. Available for tub installation or multi-beater set-up for continuous operation. For more information write for Bulletin EDJ-1079.

IN PAPER...from start to finish!

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General Chemical's coast-to-coast network of plants and supply points assures you of prompt delivery of all these basic paper chemicals...

- Aluminum Sulfate-Dry (Standard & Iron Free)
- Aluminum Sulfate-Liquid
- Salt Cake (Sodium Sulfate)
- Sulfuric Acid
- Hydrochloric Acid (Muriatic)
- Sodium Silicate
- Sodium Bisulfite, Anhydrous
- Sodium Sulfite, Anhydrous
- Chrome Alum (Chromium Potassium Sulfate)
- Aqua Ammonia
- Nitric Acid
- Sodium Thiosulfate (Hypo), $5H_2O$ and Anhydrous
- Tetrasodium Pyrophosphate, Anhydrous
- Trisodium Phosphate
- Sodium Tripolyphosphate
- Sodium Metasilicate, $5H_2O$ and Anhydrous
- Aluminum Chloride Solution
- **Baker & Adamson® Laboratory Reagents**

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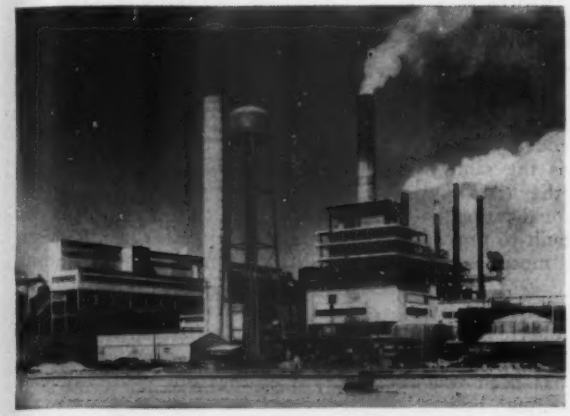
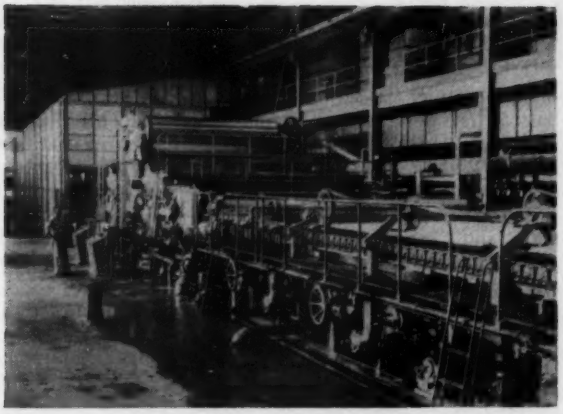
Basic Chemicals for American Industry

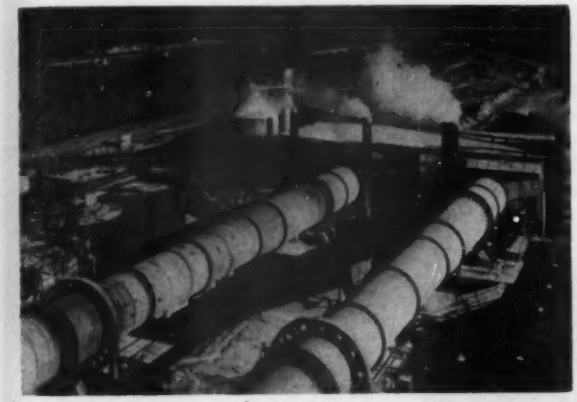
NEWS of the INDUSTRY



250-FOOT STACKS, digester housing (l) and recovery plant (r) are all in "mirror image" at Rayonier's Jesup Div. in Jesup, Ga.



WET END OF Rice Barton pulp machine at Jesup mill. The unit was part of the recently completed Jesup expansion project.



KILNS IN "mirror image" at the Georgia chemical cellulose plant. In the background is a section of the wood yard.

SECTION OF the newly enlarged finishing room at Jesup. Here chemical celluloses ride conveyors during the final processing.

Rayonier Dedicates 100,000-ton Georgia Cellulose and Pulp Plant

RAYONIER INC. HAS formally opened its second 100,000-ton chemical cellulose and wood pulp plant in Jesup, Ga. This unit—which began operating in October—boosts the firm's annual over-all capacity to 915,000 tons.

The $25,000,000 mill is a "mirror image" of the cellulose operation that went on steam in Jesup in mid-1954.

The new plant can operate as a single independent unit; or it can work in conjunction with the earlier plant—simultaneously producing the same product. On the other hand, one unit can produce wood pulps for the paper industry while the other turns out a special new cellulose for rayon tire cord.

The newer mill—like the first—has unusual flexibility and built-in operational efficiencies. It is physically inter-connected with the original mill in some departments. Steam lines, for instance, can be tied across, as can the water systems. Some chemical facilities are also tied together, and a single electric power plant is used for both mills.

The original finishing and warehousing building has been extended. The lagooning system for handling the disposal of waste materials has been enlarged and is now capable of handling 50,000,000 gal. of water daily. One disposal section handles black liquor wastes, the other provides settling capacity for the 49,000,000 gal. of wash water disposed daily.

More Than 200,000 Tons

The two mills have a combined annual production capacity in excess of 200,000 tons. Optimistic about the immediate outlook for the new

Principal Equipment and Suppliers at Jesup Mill of Rayonier

Silos and tile tanks	Stebbins Engineering & Mfg. Co.	Pulp machine	Rice Barton Corp.
Twin stacks (250 ft. high)	M. W. Kellogg Co.	Finishing equipment	Lamb-Grays Harbor Co. Inc.
Digesters (8), stainless steel-lined	A. O. Smith Corp.	Conveyors	Jeffrey Mfg. Co.
Generators (2)	Westinghouse Corp.	Pumps	Worthington Corp., Ingersoll-Rand Co., Bingham Pump Co.
Power boiler	Babcock & Wilcox Co.	Motors	Allis-Chalmers Mfg. Co., Westinghouse Corp.
Precipitator	Research-Cottrell Inc.	Miscellaneous electrical equipment (starters, etc.)	Westinghouse Corp.
Causticizing area		Switchgear and transformers	Allis-Chalmers Mfg. Co.
Lime kiln	Allis-Chalmers Mfg. Co.	Recovery boiler	Combustion Engineering Inc.
Balance of equipment	Dorr-Oliver Inc.		
Bleaching equipment	Improved Machinery Inc.		

plant, Rayonier has said that it "will bolster its sales position by making immediately available new tonnage in the highest grades of chemical cellulose and wood pulps".

Annual requirements of southern pine and hardwood total nearly 500,000 cords. With pulpwood storage designed for a maximum inventory of 20,000 cords, incoming supplies are being received 24 hours a day by both truck and rail.

Six new chip silos were built adjacent and identical to the earlier ones. A new conveyor feed was erected that can supply either the existing or the new digesters. (To the original eight digesters eight identical units were added.)

The bleach plant is the same as that constructed for the first Jesup unit. However, additional pulp storage tanks have been built to provide better blending and more storage capacity.

The new pulp machine (Rice Barton Corp.) is a duplicate of the earlier equipment.

The power plant has been redesigned and power output boosted with two new generators, each producing 7500 kva. Steam generation at the plant is supplemented in emergencies with power from the Georgia Power System.

The new Babcock & Wilcox Co. boiler has a capacity of 200,000 lb. steam per hour and operates on either oil or bark. Also installed was an additional recovery boiler nominally rated at 450 tons of kraft pulp.

The causticizing area duplicates that of the original mill.

In the recovery system all organic portions of the cooking liquors are effectively burned, leaving only the mineral constituents. These are recovered for reuse.

Dierks Arkansas Mill Enters Production

Dierks Forests Inc. for the first time in its 75-year history is producing pulp and paper. The firm recently put into operation the new $12,000,000 mill of Dierks Paper Co. in Pine Bluff, Ark.

An integrated kraft pulp and unbleached paper and linerboard operation, the mill turns out a daily 150 tons, its pulpwood supply coming from one of the largest privately-held timber tracts in the South. These 1,500,000 acres provide wood requirements to Dierks lumber mills in the region, which in turn transport chips to the new plant.

JUMBO ROLLS at the finishing end of the new Black-Clawson fourdrinier recently put into operation at the Dierks Paper Co. mill in Pine Bluff, Ark. Production consists of kraft paper and board from pine pulp.

The high-speed Black Clawson Co. fourdrinier is a 166-in. unit constructed at B-C's paper machine division in Watertown, N. Y. It features a stainless steel open headbox, a permanently-cantilevered fourdrinier and a press section consisting of suction first and second presses and a smoothing press.

The dryer section comprises forty 60-in. diameter paper dryers, three felt dryers, a breaker stack and size press. Two calender stacks separated by two paper dryers, a B-C Rollflyte reel and a Model 40 B-C winder complete the machine line.

Power is through a Black-Clawson spiral bevel gear drive.

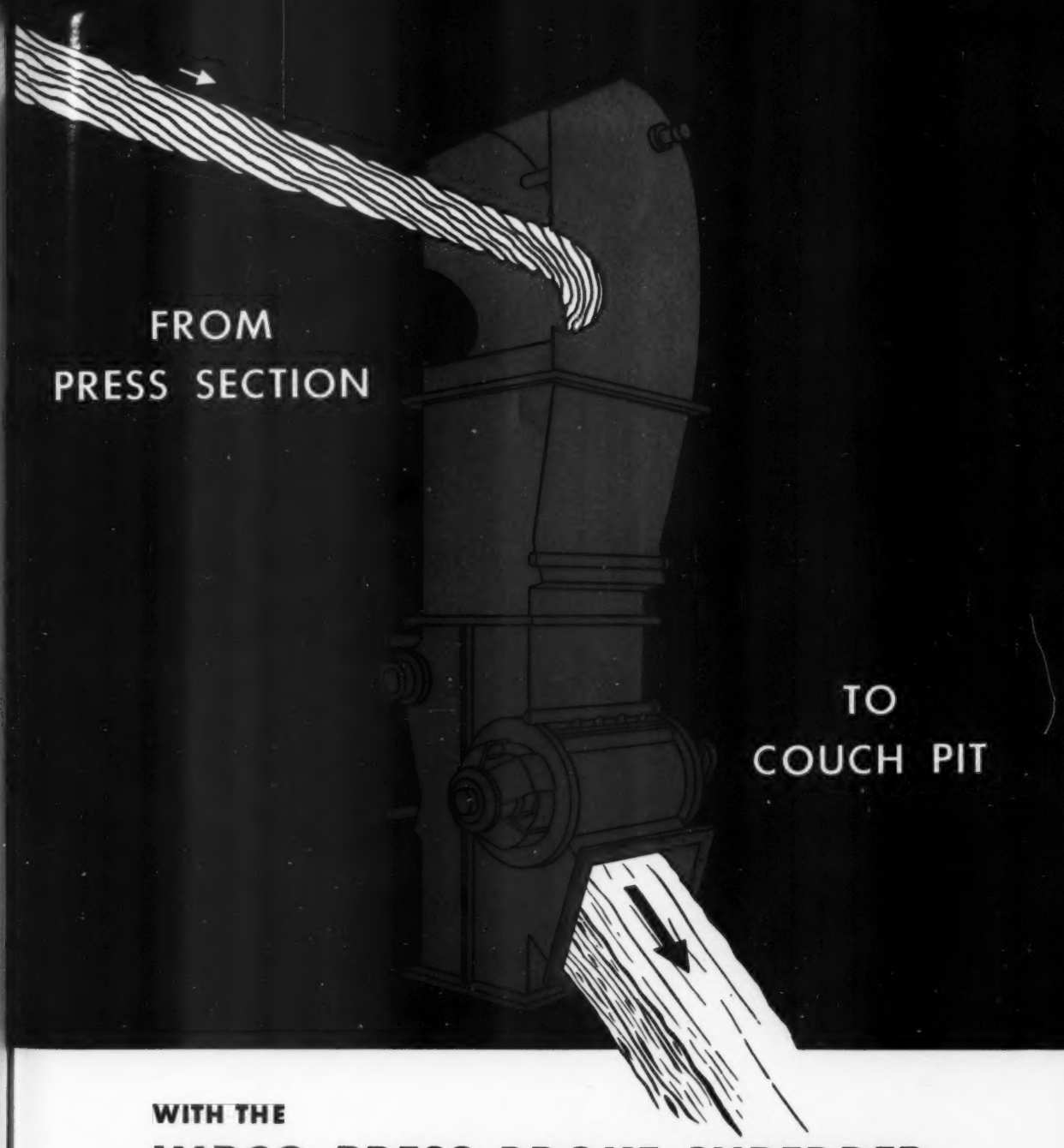
International Studies Northwest Possibilities

Studies are still underway to investigate the possibility of establishing a pulp and paper mill in the Pacific Northwest, according to International Paper Co.

The spokesman called "premature" reports that International plans pulp plants at Roseburg and Klamath Falls, Ore.

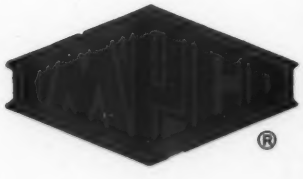
The company first disclosed its intentions to build pulp and paper facilities in the region early in 1956. At that time it reported that construction would be undertaken if

(Continued on page 932)



WITH THE

IMPCO PRESS BROKE SHREDDER



Now, your press broke can be automatically shredded and slushed to the couch pit at pumpable consistence. Completely proven in a wide range of tonnages, the unit used in the above illustration is in service on a 500 T/D kraft machine at 2500 f.p.m. at 32%.

Let us show you how this principle can be applied in your existing mill.

IMPROVED MACHINERY INC.

NASHUA • NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Limited, Sherbrooke, Quebec

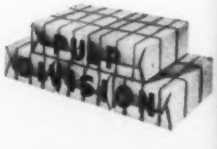
PULP TODAY...PAPER TOMORROW

To produce quality pulp for quality papers, Weyerhaeuser stresses rigid control throughout the mill.

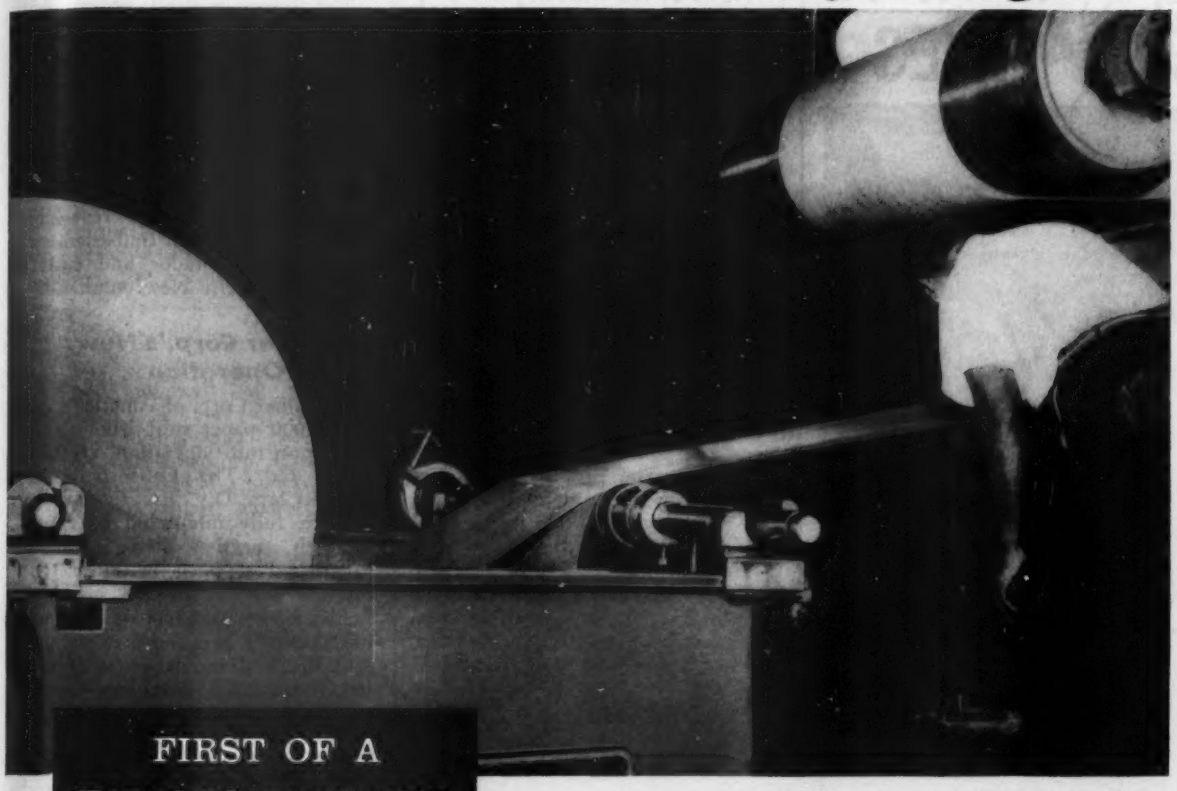
For instance, at our Everett Kraft Pulp Mill, 131 readings, tests and reports are made on process variables every hour.

And before it is baled and shipped, the finished pulp is subjected to ten major control studies. No effort is spared to make Weyerhaeuser pulp a consistently pure and uniform product that paper-makers can and do rely on.

WEYERHAEUSER



C.P. Starches...Try 'em for Size



FIRST OF A FAMOUS LINE FOR **Corrugating** AND **Laminating**

Globe®
STARCHES and DEXTRINES

Need a heavy paste of maximum adhesiveness for porous boards? Or a starch that will prevent uneven drying and curling of boards of different absorptiveness? Whether you need a starch for a highly critical operation or for general use at minimum cost, you'll more than likely find it among the Globe Starches and Dextrines—most widely used line of adhesives for corrugating and laminating.

Corn Products makes no fewer than six lines of starches and several dextrine products for these important converting operations. So no matter how tough your problem, how exacting your requirements, you'll find a Corn Products starch that's ideal for the job. Technical assistance in selecting the right one is available without charge or obligation.

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Makers also of AMIJEL,® HERCULES and TEN-O-FILM® starches for the paper industry

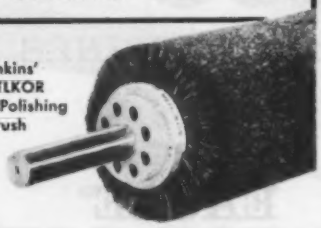
PRIVATE EYES

Jenkins' METLKOR brushes, teamed with Viking's Void Detector, check every inch of paper as it is made, find holes, measure them, count them, record them, pinpoint their positions and signal the operator, all automatically. The Jenkins' feeler brush, a critical part of the system, sends a low voltage pulse to the Viking Indicator Unit whenever a hole appears.

John Glump, Vice-President of Viking Instruments, Inc., of East Haddam, Conn., says: "Jenkins' brushes do a superb job for us. They are an improvement on 13 counts:

1. Improve accuracy of flaw detection.
2. Have no abrasive effect on product.
3. Eliminate lint problem.
4. Outlast previous brushes 3 to 1.
5. Made exactly to size, no cutting or alterations necessary.
6. Simplified mounting.
7. Improved construction.
8. Superior bristles.
9. Refillable when bristle is worn.
10. More economical.
11. Free engineering service.
12. Speedy solution to problem.
13. Quick delivery."

Jenkins' METLKOR Paper Polishing Brush



Jenkins' also makes the following brushes for the paper industry:

Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Static Elimination • Flocking • Felt Cleaning • Feed or Carrier • Paint Brushes • Floor Sweeps

Specify Jenkins' METLKOR
the original . . . the best *Metal Core* brush

METLKOR®
CYLINDER BRUSHES
and LIFEWOOD® WOOD BACKED BRUSHES

M. W. JENKINS' SONS, INC.
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News of the Industry . . .
(Continued from page 928)

and when the proposed merger with the Long-Bell lumber interests was accomplished. The merger became effective in November 1956, giving International major West Coast timber operations for the first time in its history.

CZ to Explore Mill Possibilities in Eastern Canada

Crown Zellerbach Corp. will explore the possibility of building large pulp and paper mills in Newfoundland. The proposal has been approved by the provincial cabinet and was to be submitted to the provincial assembly for confirmation.

The San Francisco firm contemplates the construction of facilities for the daily production of at least 400 tons of newsprint and up to 2000 tons of wood pulp. The project will of course be undertaken only if extensive studies prove its economic feasibility.

The Newfoundland government plans to guarantee Crown Zellerbach sufficient timber to sustain the development program. CZ on its part would develop manufacturing facilities as rapidly as the production could be absorbed.

The wood supply for the newsprint and pulp mills would be provided under 99-year renewable leases on government timberlands in southeastern Labrador and eastern and southeastern Newfoundland.

Container Corp.'s New Mill in Operation

Container Corp. of America's new $6,000,000 paper mill has recently been put into operation at Santa Clara, Cal. The California Container Corp. Div. has thereby become a fully integrated operation. Formerly, the division consumed paperboard supplied by other CCA plants.

Located on a 48-acre site, the new mill has an operating area of 132,000 sq. ft. The daily capacity of linerboard and boxboard is 150 tons.

Recent Expansions in the Industry

Bergstrom Paper Co.
of Neenah, Wis., will move its Waupaca (Wis.) Div. to a new plant to be constructed near Neenah. The former Whale Safety Paper Co. has been forced to seek a new location because of the lack of a sufficient underground water supply in Waupaca. The 40,000-sq. ft. building will house expanded safety paper production.

Container Corp. of America
has begun work on a 52,700-sq. ft. addition at its Valley Forge (Oaks), Pa. plant. The project will cost approximately $300,000 and will provide increased warehousing facilities for both the Valley Forge folding carton plant and the Manayunk plant in Philadelphia.

Champion Paper & Fibre Co.
of Hamilton, Ohio, has acquired half ownership of NRC Vaculite Corp., Cambridge, Mass. subsidiary of National Research Corp. The joint firm will undertake a major program to commercialize a new vacuum-metalized paper for packaging, building insulation and other applications. According to a recent announcement, the "product embodies many of the characteristics of metal foils and includes the advantages of inherently lower costs and greater versatility".

Interstate Container Corp.,
Glendale, Long Island, N. Y. converter of corrugated shipping containers, has purchased all the assets of Reading Corrugated Container Corp. of Reading, Pa. Interstate plans to spend "several hundred thousand dollars" to increase the Pennsylvania firm's paper capacity to a daily 100 tons. In its converting plant Reading produces corrugated boxes, sheets, etc. The purchase price was said to be well over $1,000,000.

Kimberly-Clark Corp.
will build a 60,000-sq. ft. converting plant at St. Hyacinthe, P. Q. The unit, which is scheduled for completion by fall of 1958, will produce sanitary creped wadding products for Quebec markets—specifically the Monteal area.

Certain-Teed Products Corp.'s
roofing materials plant in Niagara Falls, N. Y., closed recently as part of a centralization program, has been purchased by a group of local businessmen. The price was not an-

nounced, but it was reported to be "well below the $300,000 for which the buildings and land are assessed". The group has no definite plans for the future.

National Container Corp.,
a subsidiary of Owens-Illinois Glass Co., is establishing a converting plant in Kansas City, Mo. Production was expected sometime during the first quarter of 1958. The two-shift operation will eventually employ about 100 people.

Crown Zellerbach Corp.
has entered production at its new $4,000,000 multiwall bag plant in Bogalusa, La. Located adjacent to the paper mill operated by CZ's Gaylord Container Corp. Div., the facility covers 216,000 sq. ft. and has an annual capacity of more than 50,000,000 bags.

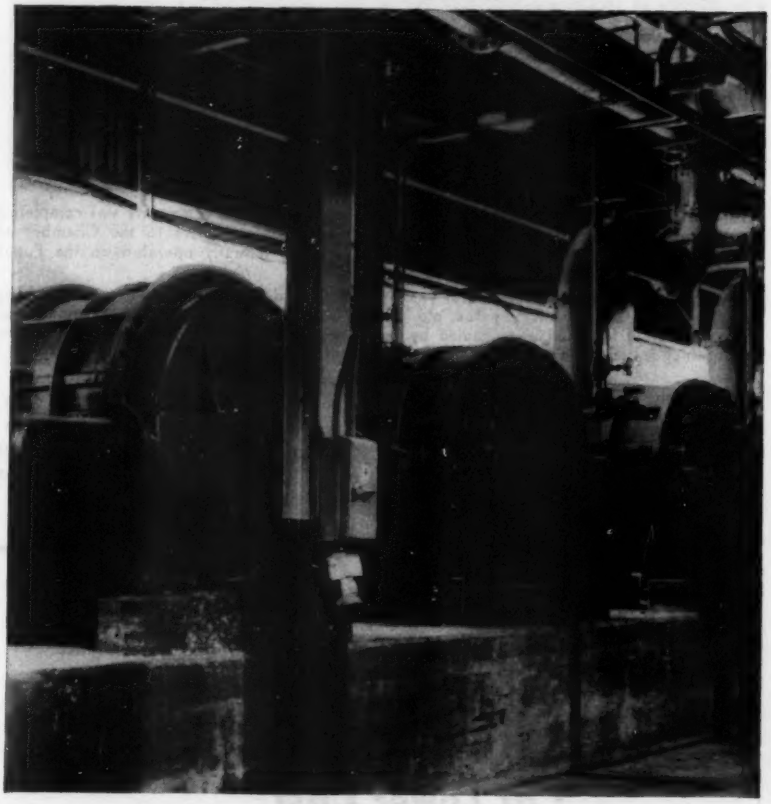
Minnesota & Ontario Paper Co.,
in keeping with its policy of concentrating its activities in manufacturing, will discontinue its ownership of Border Publishing Co. in International Falls, Minn., and publication of the *Daily Journal*. According to Paul A. Anderson, publisher and editor, every effort is being made to secure a responsible independent buyer, who will continue to give the community high-quality newspaper and commercial printing service.

Weyerhaeuser Hawaiian Co.,
newly organized subsidiary of Weyerhaeuser Timber Co., has agreed to buy the Honolulu corrugating and shipping container plant of Dole Hawaiian Pineapple Co. The facility will be modernized and enlarged and will boast new equipment especially designed to produce a variety of shipping containers of the types used by Hawaiian industry.

Mead Corp.
of Dayton, Ohio, has purchased for $145,000 a 24-acre industrial tract in Atlanta, Ga. The Ohio firm already owns Mead Atlanta Paper Co. in the Georgia city and has half interests in a pulp mill in Brunswick and paperboard mills at Macon and Rome.

Southland Paper Mills Inc.
of Lufkin, Texas, has ordered from General Electric Co. a new multiple generator transistor-amplistat control for sectional paper machine drives.

What, actually, do Vacuum Pumps on paper machines handle?



Paper mill engineers know that it is actually a mixture of air and water vapor, but the custom of rating vacuum pumps in terms of air capacity alone causes this important fact to be frequently overlooked.

The presence of this water vapor causes a considerable reduction of the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump the bulk of this water vapor is effectively condensed, due to the Nash operating principle. The air handling capacity of the Nash is therefore not reduced.

That is one of the reasons why Nash Vacuum Pumps are standard in over a thousand leading Paper Mills.

NASH ENGINEERING COMPANY
443 WILSON ROAD, SO. NORWALK, CONN.

FORMAL DELIVERY OF AN historic memento to an appreciative community was completed recently when Scott Paper Co. presented a time-honored locomotive to the Chamber of Commerce of Sedro-Woolley, Wash. The equipment was formerly operated on the Puget Sound & Baker River Rwy., a wholly owned Scott facility.

Removed from active duty several years ago when a diesel took over the moving of log trains from Scott's camp at Hamilton, old "No. 2" retired with a long record. Many millions of board feet of logs had been hauled by the sturdy iron horse in the quarter of a century during which it became a tradition among the residents of the region.

The unit will be installed in conjunction with the firm's new Pusey & Jones Corp. 270-in. newsprint machine. Speed regulation accurate to ± 0.1 per cent will be provided over a speed range of 1000 to 2700 fpm. The control also makes possible operation at slow speeds (50 to 150 fpm) for felt and wire inspections and wash-ups.

Greater Production of Higher Quality Pulp

· in Less Time

· at Lower Cost

This is the end result of the various processes and equipment which we have installed in pulp mills throughout North America. Send us details of your requirements.

Chemipulp Process Inc.
Woolworth Bldg. Watertown, N.Y.

Associated with
Chemipulp Process Ltd., 253 Ontario St., Kingston, Ontario

West Coast
A. H. Lundberg, Inc.
P.O. Box 202 Mercer Island, Wash.

Lundberg-Ahlen Equipment Ltd.
146 E. Broadway, Vancouver

Kimberly-Clark Corp. of Menasha, Wis., is constructing a 57- by 42-ft. addition to its machine shop at a cost of $38,000.

British Guiana may be the site of a $40,000,000 United States-owned pulp and paper industry. This according to a statement made following talks between Columbium Corp. of America and officials and ministers of the colonial government. The decision was taken after the successful laboratory testing of 21 native woods.

Allied News Notes . . .

DeZurik Sales Co. (sales and service organization for DeZurik Corp.) has opened an office at Summit, N. J. In charge as eastern regional sales manager is Charles Hodgdon, formerly a sales engineer in New England and New York State.

Corrugating Technicians Inc. of Tenafly, N. J., is a new firm recently organized by two former members of A. E. Staley Mfg. Co.'s technical sales group, L. O. Carlisle and R. A. Sherman. Joined by another A. E. Staley technician, W. D. Salogga, they will broker various materials and serve as technical service consultants to the corrugated box industry.

Shuler & Benninghofen of Hamilton, Ohio, now celebrating its 100th anniversary, has installed the largest felt loom in the United States. With an over-all length of 74 ft., the loom can produce felts wider than any now on order. Its speed is 26 "picks" per minute.

Bahnson Co. has announced two educational programs beginning March 3 and March 10 for maintenance engineering personnel. The theme of the project, which is to be held at the Robert E. Lee Hotel in Winston-Salem, N. C., will be, "Productive-Preventive Maintenance".

Sandy Hill Iron & Brass Works, Hudson Falls, N. Y. designer and builder of machinery for the pulp and paper industry, is this year celebrating its 100th anniversary.

Mixing Equipment Co. of Rochester, N. Y., has in operation its new hazardous materials laboratory. The purpose of the new facility is to help the paper industry solve basic problems of mixing, blending and separating with solvents and other Class I, Group D materials; also, to supply answers to specific customer problems of suspension of solids,

leaching and solvent extraction, as well as "blue-sky" research.

Link-Belt Co. has opened a district sales office in a new building in New Orleans, La. District manager is Warren K. Guy, a sales engineer since 1950.

E. D. Jones & Sons Co. has purchased the North American assets of the Zenith Pulp Press Div. of Jackson & Church Co. Included are the manufacture of pulp presses and Roto-Pulpers as well as sales rights in South America and certain other areas. Manufacturing operations are being transferred from Saginaw, Mich., to Pittsfield, Mass.

Beloit Iron Works has been granted an Export-Import Bank loan of about $3,000,000 to furnish machinery to Celulosa Argentine Co., South American manufacturer of cellulose and chemicals.

Frank W. Egan & Co. has completed a $165,000 addition to its Somerville, N. J. plant. The 16,000 sq. ft. of new floor space will be used to increase manufacturing, office and laboratory facilities.

Coming Events

Tappi

February 17-20—43rd Annual Meeting, Hotel Commodore, New York, N. Y.
March 11—Lake States Section, Stevens Point, Wis.
March 13—Kalamazoo Valley Section (joint meeting with Michigan Div. Superintendents), Inman's Restaurant, Galesburg, Mich.
March 27—Delaware Valley Section, Engineers Club, Philadelphia

Superintendents Association

March 13—Michigan Division (joint meeting with Kalamazoo Valley Tappi), Inman's Restaurant, Galesburg, Mich.
March 18—Miami Valley Division, Manchester Hotel, Middletown, Ohio
April 22—Miami Valley Division, Manchester Hotel, Middletown, Ohio

Other meetings

February 18-22—American Paper & Pulp Association (annual meeting), Hotel Waldorf-Astoria, New York, N. Y.
February 24-28—National Safety Council, Safety Management Techniques Training Course, Chicago
March 10-20—11th Annual Short Course in Quality Control by Statistical Methods, College of Engineering, University of Illinois, Champaign, Ill.
March 27-28—American Institute of Electrical Engineers, Annual Pulp & Paper Industry Electrical Engineering Conference, North Carolina State College, Raleigh, N. C.
April 9-11—Fifth Annual Conference on Accident Prevention Engineering, University of Florida, Gainesville, Fla.
April 21-23—Fibre Box Association (annual spring meeting), Edgewater Beach Hotel, Chicago

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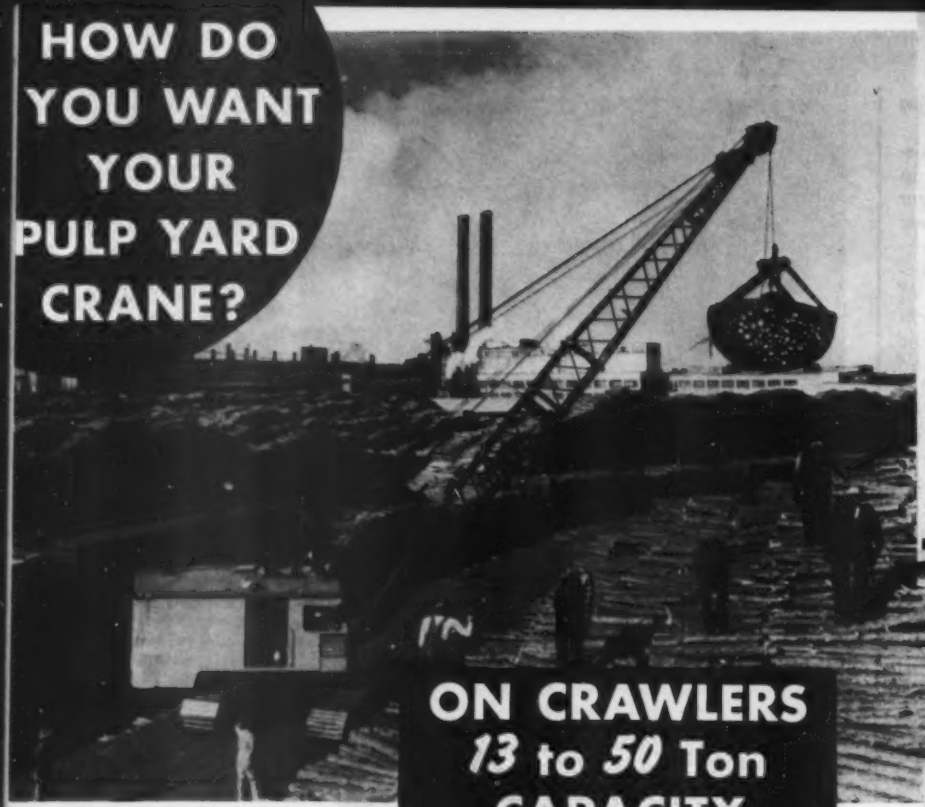

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NAMES in the NEWS

E. H. Niederauer

P. F. Winkler

Mead Creates New Executive Positions, Promotes Four

Mead Corp. has announced new operating responsibilities for six executives.

Filling two new positions are Edward H. Niederauer, who becomes general manager of white paper operations, and P. Frank Winkler, general manager for board operations. Niederauer was formerly division manager of the white paper mill at Kingsport, Tenn. Winkler was production manager for .009 board operations.

In other promotions, Paul Ellis, manager of the paperboard mill at Lynchburg, Va., becomes production manager for .009 mills. Vinson K. Shannon, manager of the Sylva, N. C. mill, moves up to the management of the Kingsport mill.

Container Corp. Promotes

Stanford H. Collins has been named manager of Container Corp. of America's paperboard mill in Cincinnati. At the same time, Raymond M. McDaniel, was made plant manager at the Noblesville, Ind. strawboard mill.

Collins joined the firm at Carthage, Ind., in 1947 and at the time of his recent appointment was Noblesville plant manager. His successor at Noblesville, McDaniel was formerly Carthage mill superintendent. He joined the corporation in 1933.

Bryan Retires as Board Chairman at Strathmore

Cassius M. Bryan, chairman of the board of Strathmore Paper Co. since 1951, has retired after more than 56 years with the firm. He continues as a director.

Bryan joined the firm in 1901 in the repair department and became successively order clerk, finishing room foreman, superintendent in each of the company's mills and general superintendent of all mills at both West Springfield and Woronoco, Mass.

He was named a director in 1925 and from 1933 to 1951 served as vice president in charge of production.

Bryan remains as president of Premoid Corp., a wholly owned Strathmore subsidiary producing imitation leather products.

In other recent Strathmore changes, Henry D. Johnston, assistant to the president, became vice president and assistant to the president; Paul A. Wilks, treasurer, was named vice president and treasurer.

F. L. Zellers

N. A. Seidensticker

Zellers Elected by Chillicothe

F. L. Zellers, mill manager since 1955, has been elected vice president of Chillicothe Paper Co. of Chillicothe, Ohio. A member of the board of directors of the Superintendents Association, he joined the firm in 1940 as superintendent. (He was president of the Association in 1937-38.)

At the same time, N. A. Seidensticker, secretary-treasurer, was named vice president and general manager; Harold L. Breiel, controller, became secretary-treasurer, and Thomas J. Rigney, costs assistant, was made controller.

In two other promotions, W. A. Thomas, since 1950 assistant mill manager and chief engineer, was appointed mill manager, and Kon Matchuk was made general superintendent. Matchuk was formerly paper mill superintendent.

N. F. Greenway

G. E. Dyke

Norman F. Greenway has been named executive vice president of the Robert Gair Paper Products Group of Continental Can Co. He was formerly vice president and general manager of the Boxboard & Folding Carton Div. and was senior vice president of Robert Gair Co. Inc. prior to its merger into Continental Can in 1956. At the same time it was announced that **George E. Dyke,** vice chairman of the board of Continental Can and acting executive vice president of the Gair Group, retired December 31.

Charles W. Cassell, for more than 25 years active in the engineering and technical branches of the pulp and paper industry, has established his own consulting practice in the field. Located in Ann Arbor, Mich., he will specialize in cost reduction, quality improvement and facilities expansion. Cassell was a graduate student at the Institute of Paper Chemistry and is a member of both Tappi and the Superintendents Association.

Powell River Promotes

Powell River Co. Ltd. of Powell River, B. C., has announced the appointment of I. H. (Harry) Andrews as vice president of planning research and development. He was formerly vice president of pulp and paper manufacture and technical services.

Associated with the firm since

(Continued on page 960)

FOREIGN ABSTRACTS

An uncertainty factor in continuous moisture determinations in paper

The uncertainty factor is hydrogen bonding. The hydrogen bonding of water to wood substance and to cellulose was studied; the materials used were pine sawdust, bleached sulfite and unbleached kraft pulps.

Of these, only the sawdust was used in the dielectric measurements, which showed that there was an abrupt change in the total dielectric constant of the wood when the moisture content was gradually increased up to about 4.5 per cent. Up to that point there was a linear increase in the dielectric constant; thereafter there is great change in the slope of the curve, which climbs sharply. This phenomenon is explained by assuming that wood substance binds about 4.5 per cent water by hydrogen bonding, and that in the bound state the polarizability and the orientation of the water molecules are so altered as to cause a change in the dielectric constant. Calorimetric measurements indicated that (assuming that 4-5 per cent of water is hydrogen-bonded) the energy of this association is 3000-4000 calories per mole of water. It is known that inconsistencies occur in the readings of continuous moisture indicators, and the above phenomenon may partly explain some of these uncertainties.

The authors give a full theoretical treatment together with a detailed report on their preparation of the wood sawdust (which is freed as thoroughly as possible of extractives); the dielectric measurements (including a diagram of the apparatus), and details of the calorimetric measurements. Sources of error are also considered.

Two graphs, one table, 18 equations and 14 references are included. Paavo-Kajanne and Aarne Hollming. *Paperi ja Puu* (Finland) 39, 465-470 (1957) (in English).

Oxidized cellulose; the determination of aldehyde groups

The author modified a method suggested by Wilson and Padgett [*Tappi* 38, 292 (1955)] which depends on the oxidation of aldehyde groups in the cellulose to carboxyl groups by means of chlorous acid.

The method was tested initially with glucose and with glucurone, and the results indicated that under the conditions of the experiment 3 moles of hydrochlorous acid were used for each molar equivalent of the aldehyde. A by-product was chlorine dioxide, which was swept out of the reaction mixture with nitrogen. A stock buffer solution was prepared from 315 grams glacial acetic acid, 55 grams sodium acetate and 0.5 gram sodium oxalate per liter. To 25 cc. of this buffer solution were added 25 cc. 0.2*N* sodium chlorite solution and 50 cc. water. This mixture was treated with either glucose (5 to 30 mg.) or glucurone (5-15 mg.). The mixture was kept overnight at room temperature and then cooled to 0° C and freed from chlorine dioxide by nitrogen. Ten cc. of the mixture was then treated with potassium iodide and the free iodine titrated with 0.025 N sodium thiosulfate. Blank determinations were always made on the reagent mixtures alone because the mixture itself suffered some decomposition at the pH used (3.5). The amount of oxidant consumed was calculated from the differences in titration between the blank and that of the actual determination. Theoretically, one aldehyde group is equivalent to 12 iodine atoms, but in the examples cited (with glucose and glucurone) the iodine values found were respectively 11.8 and 13.3 atoms. The method was checked by titration of the carboxyl groups formed in the reaction. The precision of the method was satisfactory and could be applied to a number of oxycelluloses, provided the aldehyde value did not fall below 1 aldehyde group for every 300 glucose units.

Different oxidation products of cellulose showed very different values. For example, periodate exycelluloses yielded only about 85-90 per cent of the total carbonyl content of the fibrous material. Cellulose that had been oxidized with chlorine contained aldehyde groups as well as keto groups and carboxyl groups. Cellulose oxidized with nitrogen dioxide contained aldehyde as well as carboxyl groups. Cellulose oxidized with hypobromite gave no indication of aldehyde groups — nor were these present in carefully bleached cotton linters or bleached wood pulps. They were also absent from periodate oxycelluloses that had been treated subsequently with borohydride. In its present form the method seems to be inapplicable to hydrocellulose end-group determinations.

Ulrich Ströle. *Das Papier* 11, 453-9 (1957) (in German).

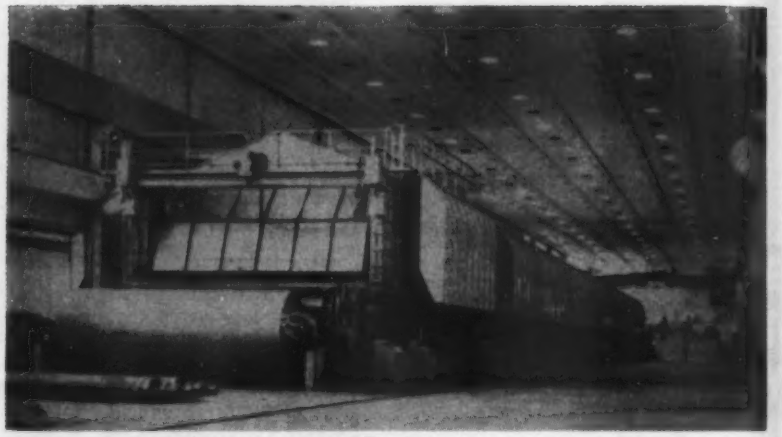

Fig. 1

Board machine at Kaukopaa

Enso-Gutzeit Oy has installed a second board machine at its Kaukopaa mill. This is shown in Fig. 1. The machine will concentrate largely on kraft liner and has a production capacity of about 100,000 metric tons per annum. The output will also include various types of bleached food packing boards (e.g. for milk containers, drinking cups, etc.). Furthermore, the machine will produce both bleached and unbleached sack paper.

Eight halftones are included. V. Loustarinen and K. Vartio. *Finnish Paper and Timber*, 8, No. 6, 79-82 (1957). (In English).

Continuous sulfite pulping

The requirements for a satisfactory continuous process are given. The cook should be rapid, carried out at the highest possible cooking temperature, and the pulp yields should be high. Thus the chips must have an adequate pretreatment, and the conditions should obviate the condensation of lignin. Chips of very small size should be used. Either the commercial sulfite cooking liquor or a solution of base should be used as the impregnating medium. Soaking in a basic solution should be carried out at about 50° C. Ammonium, sodium or potassium hydroxides were probably the

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most satisfactory, but since calcium hydroxide is in such common use, it was also considered. If the pretreatment involves sulfite liquor, soaking could be carried out at higher temperatures but not to a point at which lignin was condensed.

From theoretical considerations, it appeared that cooking for shorter time periods at 190-205° C should cause less degradation of the cellulose. However, the rate of diffusion was not increased as much by temperature as was the reaction rate, and in consequence a gradual rise in temperature proved advisable.

Using both types of presoaking of the chips, laboratory cooks were carried out at various temperatures ranging from 115 to 175° C in autoclaves immersed in hot glycerol. This was followed by very rapid cooling. From the laboratory results, it appeared that when the soaking was carried out with sulfite liquor, this should be done at 100-114°. The succeeding digestion temperatures, when too high, decreased both the yield and the quality of the pulp. From economic and technological considerations the optimum cooking temperature was about 140° using a liquor with a rather high acid content (10 g. per liter of combined and 120 g. per liter of total sulfur dioxide). The cooking time could then be shortened to 3-3.5 hrs. The pretreatment with alkaline solutions permitted the use of higher cooking temperatures, 150-160° C, without lowering the yield or affecting the quality of the pulp. The actual cooking time was shortened to about 40-60 min. However, when this alkaline treatment was used prior to the cook, technical problems were more complex. The design of digesters, feeding of chips, controls in the digestion, gas relief, removal of liquor and regenerating systems are suggested for a continuous sulfite digestion process. Similar equipment, it is claimed, can also be used for a continuous semichemical pulping process.

Three tables, 10 references and seven figures are included. N. A. Rozenberger. *Bumazh. Prom.* (The Paper Ind., U. S. S. R.) 32, No. 1, 10-14 (1957) (through the *Bull. Inst. Paper Chem.* 28, 246 (1947) (Original in Russian).

The biochemistry of sprucewood decay

This is a contribution from the Department of Biochemistry of the Central Laboratory of the Finnish Pulp and Paper Research Institute.

The properties and chemical changes taking place in decaying wood were studied. Butt rot (*Fomes annosus*) which causes great damage in Finland was investigated, and various samples of infected sprucewood taken from different areas of the log were analyzed. (cf. Fig. 2). Borings from the outer layer V were those of undamaged wood. The most heavily damaged area was that of section III, in which the estimated loss in weight was about 80 per cent; the wood in this boring retained only about 22.5 per cent of its original lignin and 17 per cent of its initial carbohydrates.

An interesting area was that indicated by IV, which is contiguous to that of V. IV is termed "aniline wood" because it is colored blue, due apparently to the interaction of iron with some phenolic product, even though this wood has lost no apparent weight and still retains its initial lignin and polysaccharide content. IV however contains certain alcoholic extractives not found elsewhere in the wood, and one of the components of this extract seems to be catechol. As the butt rot spreads from this zone, the blue color changes to red. This is apparently due to the formation of quinoidal derivatives.

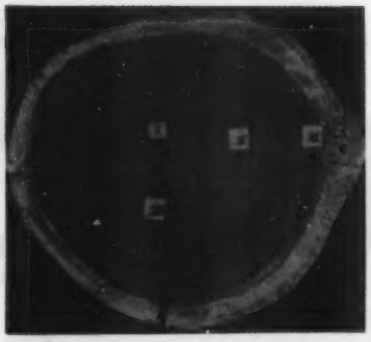

Fig. 2

The author believes that monomeric compounds are formed from the lignin during its breakdown, which could inhibit the growth of fungi. In an extensive table, the tolerance of various rot, mold and yeast fungi (and a few bacteria) to a series of aromatic compounds are shown. Of these, the rot fungus (*Coniophora cereballa*) is usually sensitive to aromatic phenols. It is assumed that during the development of a fungus attacking wood, the main function of the *phenolase* enzymes in the corrosion rots is to increase the molecular dimensions of simple aromatic compounds by oxidation and polymerization, so that the resulting products become so large that they can no longer penetrate cell membranes and are thus no longer toxic to the fungi. Such larger molecules are thus no longer involved in intercellular metabolism of the fungi. However, this does not mean that certain fungi (by means of other enzymes) cannot actually utilize a portion of the lignin. The formation of humin-like materials from the lignin is discussed.

Six tables, 4 figures and 23 references. Otto Gadd. *Paperi ja Puu, (Finland)*, 39, 363-374 (1957) (in English).

New developments in the field of water prehydrolysis

Pinewood was subjected to prehydrolysis under a variety of conditions so as to obtain if possible the optimum conditions needed for the production of a residue that would prove suitable for the subsequent kraft cook. A primary object was to simplify the over-all production of a dissolving pulp that would be high in alpha cellulose and low in the undesirable hemicelluloses.

One of the results of the study was that the prehydrolyzate need not be discarded, but that the total hydrolysis spent liquor could be incorporated into the kraft cooking liquor with an actual improvement in pulp yield and in alpha cellulose content. Chromatograms show the appearance of various simple sugars and oligosaccharides at different temperatures, ranging from 100°C to 175° after a 3-hr. prehydrolysis with water. Arabinose is split off even at 100° but simple sugars do not begin to accumulate in the liquor below the 130° range. Inasmuch as the use of a rotary digester permits the use of a 1:1 prehydrolysis-liquor-wood ratio, the kraft cook could be carried out with a 3:1 liquor to wood ratio. Time-consuming operations were obviated. These included opening of digesters, removal of hydrolyzates, washing of the wood residues prior to the sulfate digestion, etc. The kraft cooking liquor may be introduced directly after the prehydrolysis and if the digester is equipped with suitable pressurized liquor-filling equipment, the digester does not even have to be subjected to gas relief after the initial hydrolysis.

Laboratory and pilot plant experiments indicate that the process is also applicable to beech, aspen, birch, eucalypts and to reeds. In all cases, the resulting kraft pulps ranged from 91-94.5 per cent alpha cellulose. In the case of pine and Danube reeds, commercial operations confirmed results of smaller scale experiments. Ten references, 3 figures and 6 tables are included. Ursula Trobisch. *Zellstoff u Papier* 6, 139-44 (1957) (in German).

Detecting diseases in wood by a non-destructive method

To determine whether or not certain flaws are present in a wood sample (such as dry rot), ultrasonic equipment has been used that causes no damage to the wood. High-frequency sound waves are transmitted through the wood, and if dry rot is present there is a marked reduction in this transmission. The technique has been applied to red pine, beech, birch and oak.

J. S. Ward and M. J. Woodman, *Nature* 180, No. 4575, 47 (July 6, 1957).

Heat transfer and fluid flow properties of sulfite spent liquor

The three liquors studied were very high in total solids, containing respectively 37.8, 49.5 and 45.3 per cent. Viscosities, friction and heat transfer characteristics were studied, and detailed calculations are given.

The liquors behaved in a Newtonian manner. The friction factors agreed with the usual Fanning friction factor. The Nusselt number appears to agree reasonably well with that obtained from the Prandtl equation up to a number of about 40, after which the deviation from the theoretical values increased.

The author developed a correction factor for the Prandtl equation, when N_{Pr} was 30-40. The extensive tabulated data include friction factors, heat transfer coefficients and calculations of Reynolds, Prandtl and Nusselt numbers. The work was carried out under a Fullbright grant, with the author as research assistant at the University of Washington.

Five graphs, three illustrations and seven references are included. Lars Grimsrud. *Norsk Skogind.* 11, 455-65 (1957). (In English).

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PATENT REVIEWS

MELVIN NORD*

Production of consolidated lignocellulose hardboard

U.S. 2,805,946, issued Sept. 10, 1957, to Robert M. Boehm and George S. Simpson, assigned to Masonite Corp., describes a process for the production of sheet products or board from lignocellulose fiber made by the gun explosion process, utilizing the water-insoluble fines.

Before re-adding the water-insoluble fines, they are dewatered, heated to a moisture content of at least 90 per cent fines and baked. The fines are then re-slurried with the remainder of the hydrolyzed and disintegrated lignocellulose material and finally made into consolidated articles by forming into the desired shape and hot pressing. The process is shown diagrammatically in Fig. 1.

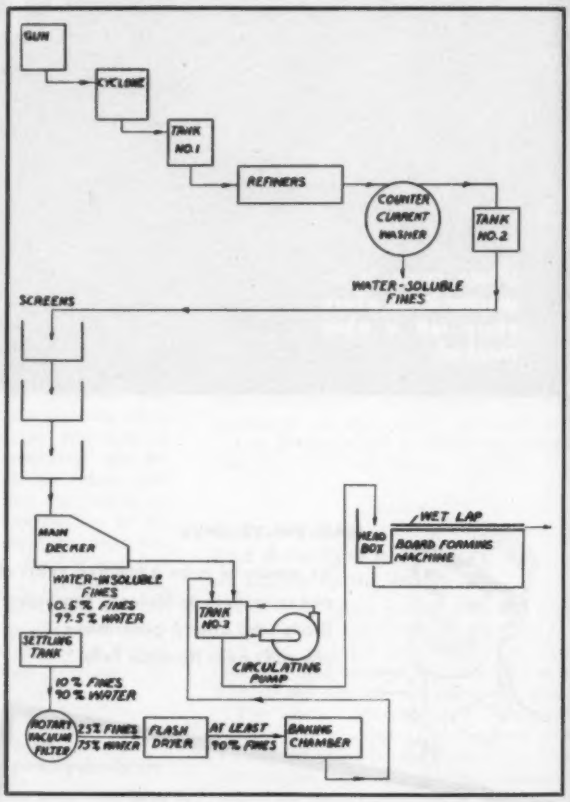

Fig. 1

Previous efforts to add the fines back to the system have failed because the fines, not being dried or baked, increased the wet lap drainage time on the fourdrinier machine far beyond any time which could be tolerated.

Process for hydrolyzing waste sulfite liquor

U.S. 2,809,219, issued October 8, 1957, to Johann Giesen and assigned to Inventa A. G. fuer Forschung und Patentverwertung, describes a process for hydrolyzing and partially hydrogenating waste sulfite liquor.

The waste sulfite liquor is treated in a neutral aqueous medium with hydrogen at a temperature of 250-300° C and a pressure of

*Patent attorney, 17600 Pinehurst, Detroit 21.

300-1000 atm in the presence of a water-soluble hydrogenation catalyst (ammonium thiomolybdate or ammonium thiotungstate). About 25 per cent of the lignin is converted into an oily distillate consisting of predominantly phenolis character—mainly pyrocatechol.

Ventilated shipping container

U.S. 2,807,401, issued Sept. 24, 1957, to Lee M. Smith and assigned to International Paper Co., describes a corrugated paperboard container with ventilating corners for the shipment of citrus fruits.

Fig. 2 is a view of the erected container showing the liner insert and the top half removed.

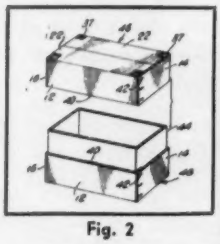

Fig. 2

Sheets of paper containing filaments of fungi

U.S. 2,811,442, issued October 29, 1957, to Willis M. Van Horn, Bernard F. Shema, William H. Shockley and Julian H. Conkey, assigned to the Institute of Paper Chemistry, relates to the use of mycelium in the manufacture of paper.

Substantially pure filaments of fungi are prepared and disintegrated in substantially the same manner as in the manufacture of paper. The disintegrated fungi may be suspended in water and then made into a sheet, or may first be combined with cellulose fibers.

A sheet fabricated from mycelia, with as little as 10 per cent by weight of cellulose fibers has unusual flexibility. When the sheet is subjected to heat or pressure a continuous film is formed that is both transparent and flexible. Paper sheets including the mycelia have high gloss, good printing characteristics and flame-resistant properties.

The patent describes the method of growing mycelia having the desired characteristics.

Production of corrugated paper products

U.S. 2,806,787, issued Sept. 17, 1957, to Harry A. Toulmin Jr., assigned to the Commonwealth Engineering Co. of Ohio, describes a method of making boxboard having high wet and dry strengths and good resistance to crushing, utilizing a dextran-formaldehyde resin.

The patent describes the method of producing the dextrans and the resins. The process is shown diagrammatically in Fig. 3.

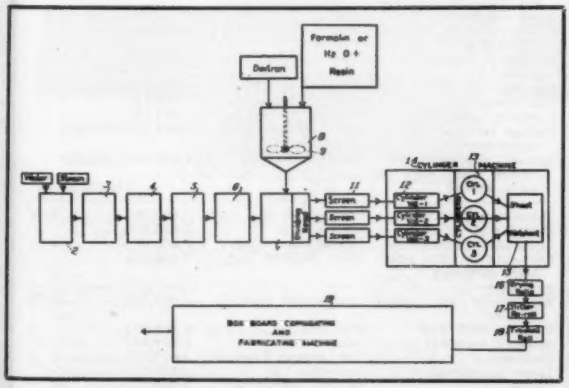

Fig. 3

Beater apparatus

U.S. 2,807,989, issued October 1, 1957, to Jose L. Schaan, Marc L. de Gail and Arnold J. Barea, assigned in part to Etablissements E. & M. Lamort Fils, describes a beater apparatus for use in the manufacture of paper or cardboard.

Such machines comprise a fixed member and a movable member between which the material to be treated passes. These members are provided with blades or segments of hard material such as stainless steel, bronze, lava and various agglomerates. The concep-

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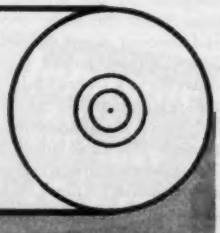

TENNESSEE CORPORATION

617-29 Grant Building, Atlanta, Georgia

tion that has hitherto governed the construction of such machines has been to disintegrate the material to be treated by means of the hardest possible members, which results in various inconveniences and particularly a disadvantageous shortening of the fibers that the material contains and a reduction of their felting capability.

According to the present invention, these disadvantages are minimized or reduced by causing the material to be treated to pass between members. At least one of these members is provided with agitating means of an elastomeric material, the elastic deformation of which is of the order of that of rubber, or rests on the frame of the machine that supports it through the intermediary of a mass of material having the same characteristic.

Container for packaging tacky materials

U.S. 2,804,205, issued Aug. 27, 1957, to John S. Barton, Wallace J. Follette and Fred L. Schmidt, assigned to Crown Zellerbach Corp., provides a container for use in packaging tacky materials such as wax, asphalt or rubber. This is an improved container which can be removed rapidly and easily from the tacky contents without contamination.

The container consists of a paper bag, bonded on its inner surface with a release coating consisting of a synthetic elastomer such as an acrylic polymer.

Apparatus for wood chip digestion

U. S. 2,809,111, issued October 8, 1957, to Leonard G. Duranf, James E. Irvine, Rohe V. Pennington and Alphonse Surino and assigned to Condi Engineering Corp., relates the continuous digestion of wood chips for making them into pulp.

The patent provides a chip drainage station for draining cooking liquor from the chips after a first cooking stage, and before cooking in a secondary vessel in their absorbed and adsorbed liquor.

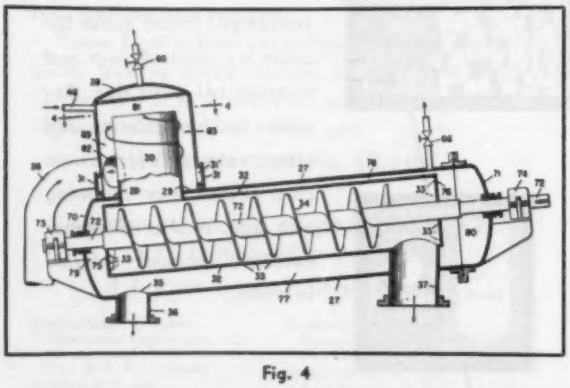

Fig. 4

The chip drainer is shown in Fig. 4. The chips are pumped through the tangential inlet opening 82 into a steam dome 28. The chips and their liquor are swiveled around the stack 30, as indicated by the arrows, until they reach the elevation of weir edge 81 of the stack, over which the chips and their liquor spill and descend down the stack into the cylindrical drainer tank 27. The chips are moved up along the inclined drainer by the screw conveyor 34, meanwhile being drained of their liquor through the perforations 33 to be received by the space 77 beneath the bottom of the inner tank or drainer, from which the liquor flows through discharge pipe 36 to subsequent treatment or recovery. The drained chips are moved uphill by the screw conveyor 34, fall down discharge pipe 37 that leads them with only their absorbed and adsorbed liquor in the digester tank.

The temperature and pressure surrounding the chips is maintained by steam from two sources. The drainer is open to the digester through the large pipe 37 so that digester pressure and temperature are maintained. The dome 28 is also connected through equalizing pipe 48 to an accumulator, from which steam can be introduced to the dome 28.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Baryta-coated photographic paper	Eastman Kodak Co.	2,805,161	9/3/57
Milk carton convertible to a toy	Felix Palm	2,805,516	9/10/57
Method of applying handles to bags	Sali Grocery & Paper Co.	2,805,607	"
Can carrier	Federal Paper Board Co. Inc.	2,805,791	"
Conical paper cups	American Can Co.	2,805,808	"
Container with sipper straw	William A. Pugh	2,805,809	"
Corner packing	Continental Can Co. Inc.	2,805,810	"
Collapsible cardboard box	Carl T. Osterberg	2,805,811	"
Auxiliary container closing cap for cereal boxes	Billy B. Seaton	2,805,812	"
Cake carton	Advance Lithographing Co.	2,805,813	"
Multiple compartment bag having readily-separable, individual compartments	Roto Bag Corp.	2,805,814	"
Combined letter and envelope	Martin B. Loetscher	2,805,815	"
Method of making packaging materials	Central States Paper & Bag Co.	2,805,973	"
Belt package	A. Stein & Co.	2,806,590	9/17/57
Disposable tissue receptacle	Arthur I. Appleton	2,806,591	"
Packaging of articles for shipment	Pryor Inc.	2,806,592	"
Counter display easel	Container Corp. of America	2,806,608	"
Can carton	Paperbox Corp.	2,806,630	"
Shipping container for tablets, having dispensing structure	The Cramer Chemical Co.	2,806,633	"
Folding paperboard center handle carrier	Continental Can Co. Inc.	2,806,643	"
Wardrobe for hanging garments	Belsinger Inc.	2,807,354	9/24/57
Protective packing device for automobile fenders	Arvey Corp.	2,807,356	"
Can carrier sleeve with bottom holding flaps	Federal Carton Corp.	2,807,357	"
Cigarette packages	Irving Zion	2,807,358	"
Jacket for phonograph records	Kenneth G. McKiernan	2,807,359	"
Packing for glass windshields, etc.	International Paper Co.	2,807,360	"
Container and handle	Crown Zellerbach Corp.	2,807,389	"
Paperboard shipping container for blood, plasma and serum	Continental Can Co. Inc.	2,807,402	"
Triangular carton	The Lord Baltimore Press Inc.	2,807,403	"
Window carton with cushioning structure	Container Corp. of America	2,807,404	"
Collapsible containers	Richard Lambert et al.	2,807,405	"
Box with reinforcing lip	Office Equipment Mfg. Co. Inc.	2,807,406	"
Handle for paperboard containers	Robert E. Van Rosen	2,807,407	"
Slotting device for use in the corrugated and fiber box industries	Crown Zellerbach Corp.	2,808,106	10/ 1/57
Packing material for fragile articles	Keyes Fibre Co.	2,808,189	"
Heavy-duty telescopic container	Crown Zellerbach Corp.	2,808,190	"
Lap tray	Charlotte A. Cramer	2,808,191	"
Food container	John T. Raisin Corp.	2,808,192	"
Cushioned hexagonal carton	S. Curtis & Son Inc.	2,808,193	"
Package container for gift merchandise	Hiram Walker & Sons Inc.	2,808,194	"
Spliced construction of twisted paper yarn for use in weaving	The Cellucord Corp.	2,808,356	"
Carton-folding machine	Delson Candy Co.	2,808,766	10/ 8/57
Molded pulp set-up box	Chaplin Corp.	2,808,976	"
Carton with cushion liner	Federal Carton Corp.	2,808,977	"
Pad structure for paperboard containers	Stone Container Corp.	2,808,978	"
Bag valving and sleeving machine	International Paper Co.	2,809,569	10/15/57
Pump for paper pulp	Otto Imset	2,809,591	"
Hydraulic log-peeler	Anton Hoiss	2,809,683	"
Container	The Lawrence Paper Co.	2,809,775	"
Corner lock cartons	Somerville Ltd.	2,809,776	"
Cartons	National Biscuit Co.	2,809,777	"
Combination stationery and envelope	Halla M. Harrison	2,809,778	"
Construction panel	Keyes Fibre Co.	2,809,908	"
Manufacture of paper bags	Natronzellstoff-und Papierfabriken A. G.	2,810,328	10/22/57
Apparatus for scoring and severing tubed box blanks	Hankins Container Co.	2,810,329	"
Boxing and display unit	Essick Mfg. Co.	2,810,474	"
Folding display box	Gardner Board & Carton Co.	2,810,475	"
Can-containing carton	Waldorf Paper Products Co.	2,810,476	"
Fiberboard drums	Bowater Research & De-	2,810,505	"

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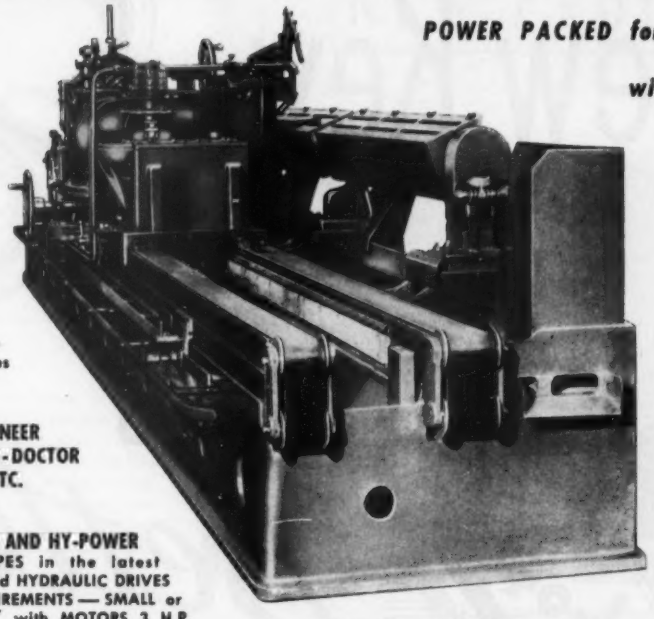

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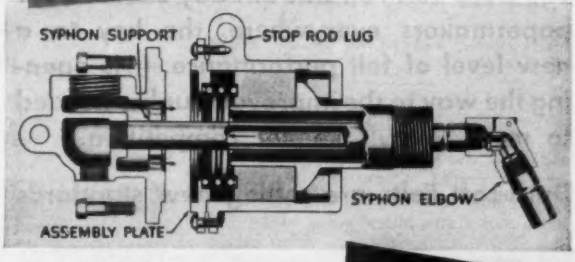

Type "SBP" shown is completely self-supporting. Like all Johnson Joints it has no packing, needs no lubrication or adjustment. The syphon elbow replaces unwieldy curved condensate drainage pipes with two straight pipes, hinges to pass right through the joint. Write for Bulletin S-3002. Johnson Rotary Pressure Joints are available for all operating speeds, pressures, mountings.

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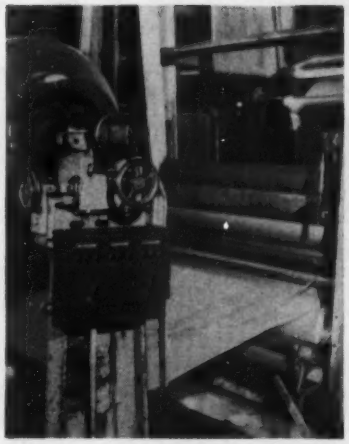
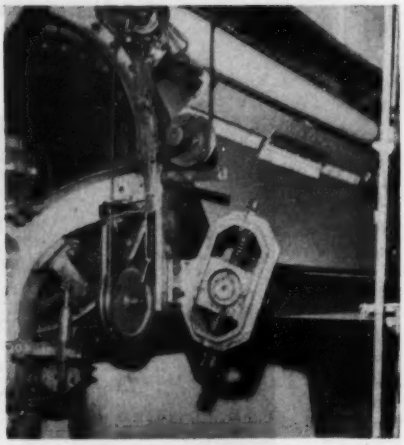
NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.





Electronic void indicator

Viking Instruments Inc. has developed a unit called the Viking Electronic Void Indicator to detect holes and defects in the production of paper, plastics, rubber, etc.

The unit consists of a Metlkor feeler brush (made by M. W. Jenkins' Sons Inc.) electrically linked to the indicator unit. The material being produced is passed between the brush and a grounded metal roll. Whenever a hole appears the brushes contact the grounded roll and transmit a low-voltage pulse to the indicator.

It has been stated that the indicator finds holes as small as 1/64 in., measures them, pin-points their position, counts them and records them. Lights and bells are used as a warning to the operator when defects occur. All of this is done automatically.

A house organ fully describing this unit and its operations is now being offered by *M. W. Jenkins' Sons Inc.*

Circle No. 11 on Readers' Service Card

Coating resin

Resyn 2203[R] is another entry into the field of vinyl copolymers. Developed especially for the paper industry, this coating emulsion is said to possess an excellent film flexibility and strength. It is also characterized by low viscosity, superior pigment-binding ability, excellent film clarity and good mechanical stability. *National Starch Products Inc.*

Circle No. 12 on Readers' Service Card

Automatic control for wet end dryers

Exact temperatures desired on each individual wet end dryer can be set instantly and maintained automatically through a new control system now on the market.

This system is designed for use on the first three to eight wet end dryers. It is said to prevent picking, curling and cockling of paper and board by providing gradual and uniform temperature increases from one dryer to the next.

The exact temperature desired is set on a remote pilot controller for each individual wet end dryer being controlled. This setting is indicated on a large dial by a red pointer. A black pointer on the same dial shows actual temperature inside dryer.

According to the manufacturer, the system is the simplest, fastest-acting and most accurate yet developed for control of individual wet end dryers. *Stickle Steam Specialties Co.*

Circle No. 13 on Readers' Service Card

Kit for making precision working models of machines

A unique new machine construction kit now being manufactured for engineers, machine designers and automation specialists enables them to make precision working models of practically any type of machine.

The construction system known as FAC uses a basic construction concept. The models are said to have such ruggedness, precision and long wear life properties that they can be used as machines and test equipment for doing research and development work. There are two sizes made in these kits . . . FAC-X1 kit and FAC-X2. Extra parts for expanding the basic kits can be catalog ordered for delivery from warehouses in the United States. *FAC Division.*

Circle No. 14 on Readers' Service Card

Multiple-head drill

A new heavy-duty multiple-head drill capable of drilling round or slot holes in lifts as high as 2¼ in. is now being manufactured.

The fixed table on this unit enables the operator to maintain a fixed feeding position. It makes for a smoother flow of work with less physical effort. Because the drills are brought down to the work on the machine, the lift of paper cannot shift out of alignment. The result is uniformly accurate positioning of holes in each lift. *E. P. Lawson Co.*

Circle No. 15 on Readers' Service Card

Aluminum valves

Gate valves of aluminum alloy are now being offered for general application. They are currently available from ½ in. through 24 in. in size and include types for every requirement where aluminum piping systems are now being used.

A bulletin is available from the company which lists the characteristics along with other data on these valves. *Darling Valve & Mfg. Co.*

Circle No. 16 on Readers' Service Card

All-synthetic belting

Texalon is the name given to a new stretch-free all-synthetic belting for mechanical power transmission. This belting is a woven nylon textile with a core of extruded nylon.

The belting can be made endless in a matter of minutes in the customer's plant, or purchased to specifications. Horsepower ratings and physical properties are all included in a 6-page folder which is available from *J. E. Rhoads & Sons.*

Circle No. 17 on Readers' Service Card

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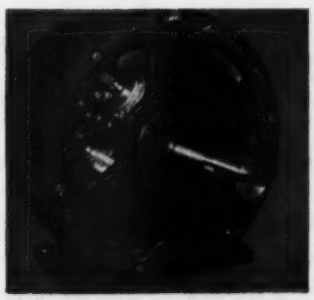
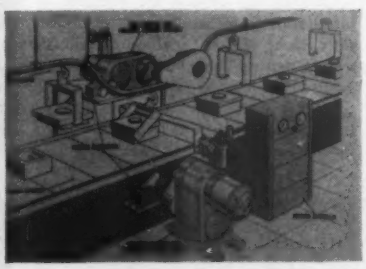


New Products . . .

6000 lbs. has been developed. It is small enough to be carried in one hand, making it quickly available for countless tasks.

The reel-in rate of this model is 10 fpm at a load of 6000 lbs. *All American Engineering Co.*

Circle No. 18 on Readers' Service Card



Control system for conveyors

A new position or link synchronization control system for conveyors is now on the market. It permits variable speeds of assembly or production conveyors on those applications where absolute position synchronization between two conveyors is required.

Position synchronization is accomplished by the control system regardless of the base speed of the conveyors, load variations on the individual conveyors or differences in conveyor lengths. Position can be held within plus or minus 3 in. *U. S. Electrical Motors Inc.*

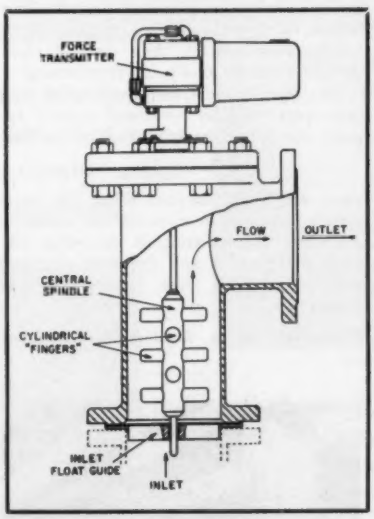
Circle No. 19 on Readers' Service Card

Fuel oil stabilizer and soot remover

A combination of a fuel oil stabilizer and catalytic additives to prevent soot deposits has just been developed.

Harcoite fuel oil catalyst now makes it possible with one treatment, states the company, to prevent soot and slag deposits from collecting on the fire-side of the boiler while preventing sludge build-up in the storage tank and carbonization at the preheaters and nozzles. *Harco Chemical Co.*

Circle No. 20 on Readers' Service Card



Stainless steel consistency regulator

The schematic drawing above shows a consistency regulator which provides continuous measurement and automatic control of pulp and paper stock consistency.

The regulator measures stock consistencies in the range of 2 to 8 per cent with an accuracy of plus or minus 0.1 per cent. A specially designed float in the form of a central spindle with projecting cylindrical "fingers" is placed in the main stock flow causing the stock to be sheared or deformed about it. This kneading action creates a force which is sensed and pneumatically transmitted by a force transmitter. *Fischer & Porter Co.*

Circle No. 21 on Readers' Service Card

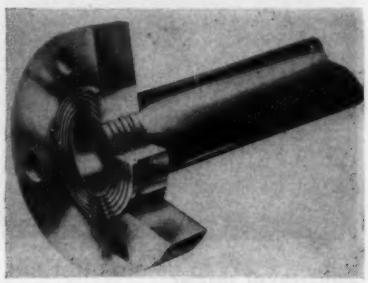
Compounds used to impart flame-proofing to paper products

A series of new brominated compounds is used to impart flame-proofing and self-extinguishing characteristics to plastics, protective coatings, fluids, textiles, paper and wood products where fire resistance is important.

The new products are tetrabromobisphenol-A tetrabromophthalic anhydride, tris (2-bromoethyl) phosphate, pentabromophenol, and tris (2,3-dibromopropyl) phosphate.

Testing quantities of the new flame-proofing compounds are available from *Michigan Chemical Corp.*

Circle No. 22 on Readers' Service Card



Flanged fittings

A new stainless steel serrated insert with carbon steel flange is now available. Designed specifically for use with lightwall stainless steel piping systems where possible future changes make welding of joints undesirable, the connection can be flanged.

These fittings are available in a range of sizes and types to provide a complete system for connecting lightwall stainless piping without welding. Such systems are readily connected with existing conventional systems. *Horace T. Potts Co.*

Circle No. 23 on Readers' Service Card

Heavy-duty hydraulic paper cutters

Three new sizes of heavy-duty hydraulic clamp cutters are now being manufactured for mill use. The sizes are 60, 66 and 69 in.

The new sizes were determined after a study of paper mill requirements made by the manufacturer. Extended rear tables that permit rear loading of larger sheets have

also been designed especially for mill use. These larger cutters will feature the "truly-cushioned" hydraulic clamp. Clamp pressure can be precisely controlled for each type of stock and will hold it solidly without variation throughout the entire cutting cycle.

Many other new features have been added to these units. *E. P. Lawson Co.*

Circle No. 24 on Readers' Service Card

Film adhesive

A new, 4-mil thick 100-per cent reactive synthetic rubber-resin film adhesive has been developed for the bonding of flexible plastic film to rigid plastics, plastic skins to honeycomb cores, etc.

This new Plymaster V-3 dry film adhesive is available in 36-in. width in 100-yard and larger rolls with protective interliner.

Technical data on this adhesive is available from *Rubber & Asbestos Corp.*

Circle No. 25 on Readers' Service Card

Split-level mixer

Here is a 150-gal. split-level mixer which was designed for use in the paper and plastics industry.

The company has stated that the split-level dispersion bowls provide 50 per cent additional effective mixing area, eliminating high-speed throw-out and peak loads, and produce a homogeneous mix in a short cycle. Other features include: single- or multiple-discharge ports; double-end drive; forced-feed lubrication, and working capacity.

Models are also available in 350-, 750- and 900-gal. sizes. The company welcomes your request for further information on this new model. *Read Standard.*

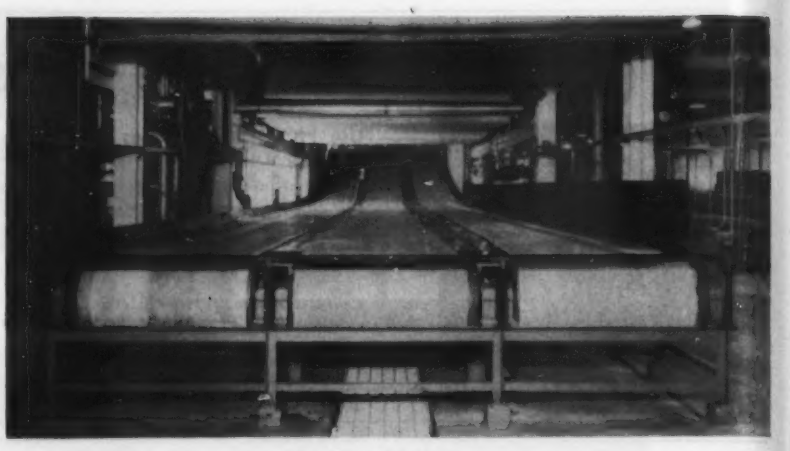
Circle No. 26 on Readers' Service Card

Steam jacketing increases utility of chemical pumps

Steam jacketing for the company's line of Fig. 3715 chemical pumps has been announced by Goulds Pumps Inc.

The pumps provide the process industries with centrifugal pumps especially designed for handling acids, alkaline liquor, water and slurry service. When the entire system is heated to maintain the solubility advantage, the jacketing of the pump prevents precipitation and attendant clogging, shaft scoring or seal damage. *Goulds Pumps Inc.*

Circle No. 28 on Readers' Service Card



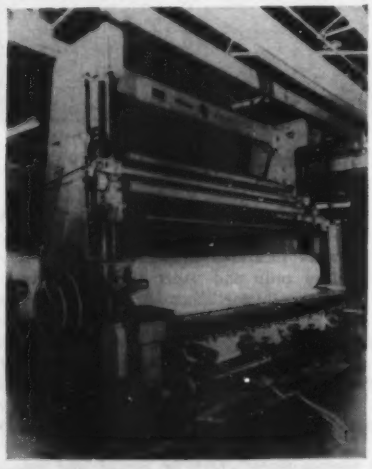
Broke conveyor

Featuring a multiple-belt design in order to accommodate broke from huge paper machines, the new broke conveyor carries the broke away as soon as it appears. This belting is of the claw-top (rough) type to which paper adheres, thus assuring rapid take-away of the broke for reprocessing.

One such broke conveyor installed at a large paper mill is positioned directly beneath the critical broke section of the final papermaking operation. It carries broke directly to a repulping tank, disposing of all manual and batch handling.

The conveyor is automatically controlled, starting when an electric eye beam beneath the paper machine is interrupted by broke falling onto the belts. It can also be manually controlled. *Gifford Wood Co.*

Circle No. 27 on Readers' Service Card



Slitter-rewinder

Here is one of the larger models of the new TD series of slitter-rewinders designed by the company. This model TD-12 is now in operation at Crystal Tissue Co., Middletown, Ohio.

Operating at full design speed of 3000 fpm, the unit has a maximum trim of 122 in. on tissue grades from 9-20 lbs. basis weight. It is capable of handling rolls of up to 60 in.

Outstanding among the features of this installation is the application of double-side shift shear slitters, including trim slitters, which can be pneumatically shifted and positioned in unison. The winder is equipped with an automatic roll ejector and a roll lowering table. As an added safety feature, all idlers are equipped with air brakes. *Black-Clawson Co.*

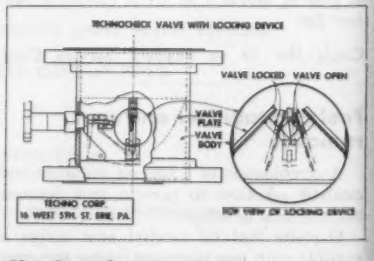
Circle No. 29 on Readers' Service Card

Heavy-duty steam cleaner

Completely self-contained and fully automatic, a new model has been designed for the company's line of industrial cleaners.

Designated as the 280 Blast-Master, this heavy-duty steam cleaner is said to have great versatility and is designed especially for heavy equipment, industrial plants, etc. *Clayton Mfg. Co.*

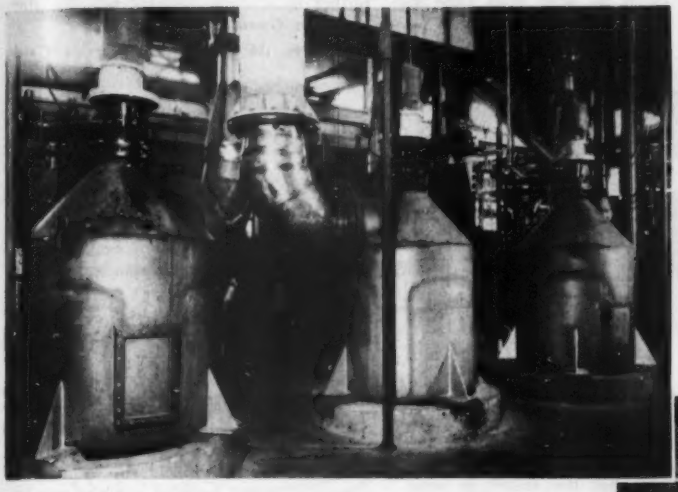
Circle No. 30 on Readers' Service Card



Check valve

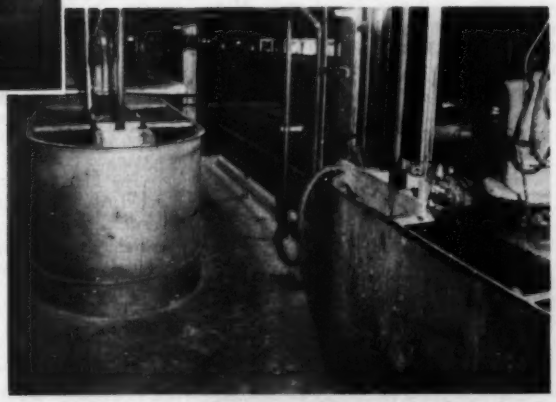
Recent modification of the Technocheck valve (a patented silent seatless check

AT ST. REGIS...IT'S DeZURIK

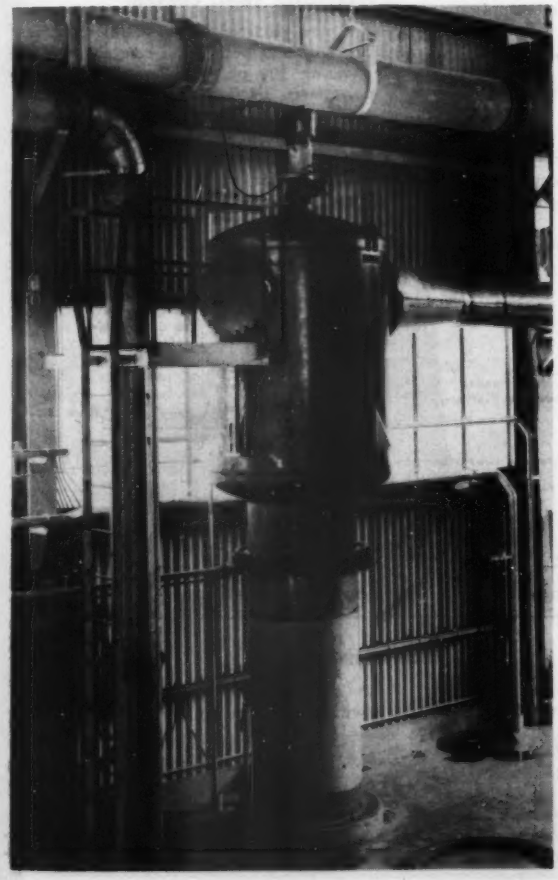


14 Regulators Installed on Paper Machine Stock System!

St. Regis Paper Company, Jacksonville, Florida, specified DeZurik Stock Consistency Regulators for the stock system of their new paper machine. Fourteen DeZurik Regulators are in use on a variety of installations. Here are some of the reasons for St. Regis's choice.



These three DeZurik Pipeline Regulators control hardwood and pine stock directly ahead of magnetic flowmeters, operating accurately under pressure, eliminating the need for headboxes.



The DeZurik Open Regulators, pictured above, control the consistency of the primary and secondary stock to the fan pump and act as headboxes. They handle the full volume of stock — not just a sample. No extra piping system is needed for sampling pumps and lines — no problem in getting an accurate sample.

This huge DeZurik Pipeline Regulator, left, accurately controls the consistency of the stock to the refiners at a design rate of 1100 tons per 24 hours. DeZurik Pipeline Regulators can be installed at any convenient location, regardless of elevation.

For any flow rate — for any installation — there's a versatile DeZurik Stock Consistency Regulator that will provide accurate, dependable service. Write for more details.

DeZURIK CORPORATION
SARTELL, MINNESOTA

New Products . . .

valve) provides a device for locking the valve in the closed position.

The new feature affords protection where sticking of the valve in the open position may cause disruption of processes or service.

This valve is furnished in various materials and is built in sizes from 4 to 14 in. inclusive. *Techno Corp.*

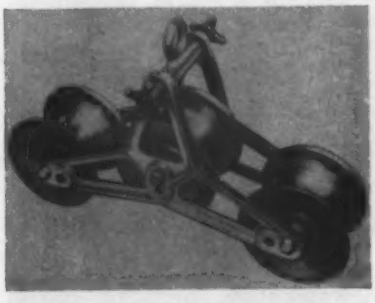
Circle No. 31 on Readers' Service Card

Controlled volume pumps

A new model has been added to the miniPump line of controlled-volume pumps.

Driven by 1/3-hp, single-phase, 60-cycle, 115-v electric motors, these pumps may have single or duplex liquid ends. Maximum capacities per liquid end are 300, 490, 760, 985, 1190, 1970, 3030 and 3940 milliliters per hour. *Milton Roy Co.*

Circle No. 32 on Readers' Service Card



Triple-pulley cable guide

A new triple-pulley cable guide to simplify the installation of cables in a cable trough or ladder system is shown in the photo.

The pulleys are adjustable to different radii, thus permitting a single device to be suitable for virtually any turn desired. The cables thus can be laid in over the frame rather than having to be pulled through. *Rome Cable Corp.*

Circle No. 33 on Readers' Service Card

Chain saw

A direct-drive gas chain saw has just been introduced designed for compactness, portability and power.

Known as Model 534, this saw has outstanding power and stamina for felling and cutting trees up to 48 in. in diameter. It is available with 14-, 16-, 20- and 24-in. bar sizes and has a 4½ hp engine. *Porter-Cable Machine Co.*

Circle No. 34 on Readers' Service Card

Portable conveyor and stacker

Flex-Bend is a new push button-controlled, electrically-powered portable conveyor and stacker which is now on the market.

This conveyor has the ability to bend horizontally in either direction to mechanically carry materials around stationary objects.

The Flex-Bend conveyor and stacker has standard unit components, which are: power stacker car, belt drive car, power traveler car and any number of center cars. Users specify the number of center cars desired to meet the over-all length requirements of their individual applications. *Jervis B. Webb Co.*

Circle No. 35 on Readers' Service Card

Centrifugal pumps

A complete line of heavy-duty vertical centrifugal pumps for sump and process service has been introduced to the industry.

These single and duplex units, both wet and dry type, have capacities to 1080 gpm with heads to 290 ft. for pit depths up to 20 ft.

The company welcomes your requests for further information covering this new line of pumps. *Goulds Pumps Inc.*

Circle No. 36 on Readers' Service Card

New style brake

Announcement has been made on the new style "HTC" 50 series brake for use with fractional-horsepower electric motors in frames 56-C and 66-C, also integral motor frames 182 and 184. This brake is available for operation on all standard ac voltages. *Stearns Electric Corp.*

Circle No. 37 on Readers' Service Card

Polyvinyl acetate emulsion

A new material called Resin D-700—spray-dried GELVA (polyvinyl acetate emulsion)—is now sold in commercial quantities in the form of a white powder.

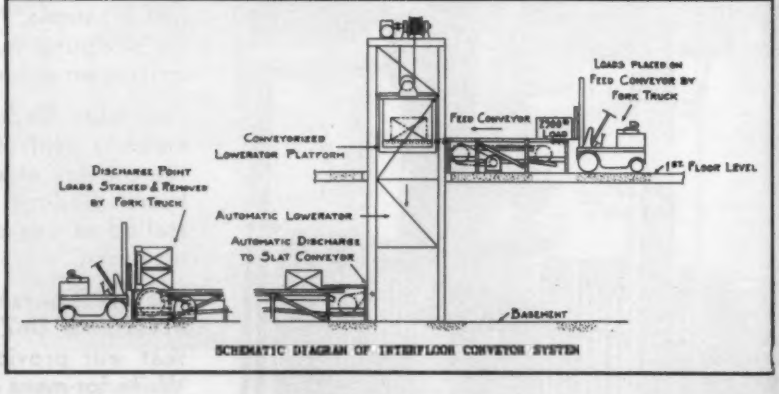
It is said to disperse readily in water to form stable dispersions and may be combined with other dry ingredients. *Shawinigan Resins Corp.*

Circle No. 38 on Readers' Service Card

Electronic feed control

A new electronic feed control can maintain within 5 per cent a constant and unwavering 100 per cent flow of feed into pulverizers, hammermills, extractors, mixers, attrition mills, roller mills and other motor-driven processing machinery. Effective liquid feed control can also be achieved. *Load Star Corp.*

Circle No. 39 on Readers' Service Card


Loads Placed on Feed Conveyor by Fork Truck
Feed Conveyor
Conveyorized Lowerator Platform
Discharge Point Loads Stacked & Removed by Fork Truck
Automatic Lowerator
Automatic Discharge to Slat Conveyor
1st Floor Level
Basement
SCHEMATIC DIAGRAM OF INTERFLOOR CONVEYOR SYSTEM

Interfloor conveyor

Completely automatic, this heavy-duty inter-floor conveyor system (see photo) can be used wherever the problem consists of transferring large amounts of incoming materials (weighing up to 25 lb.) from one level to another.

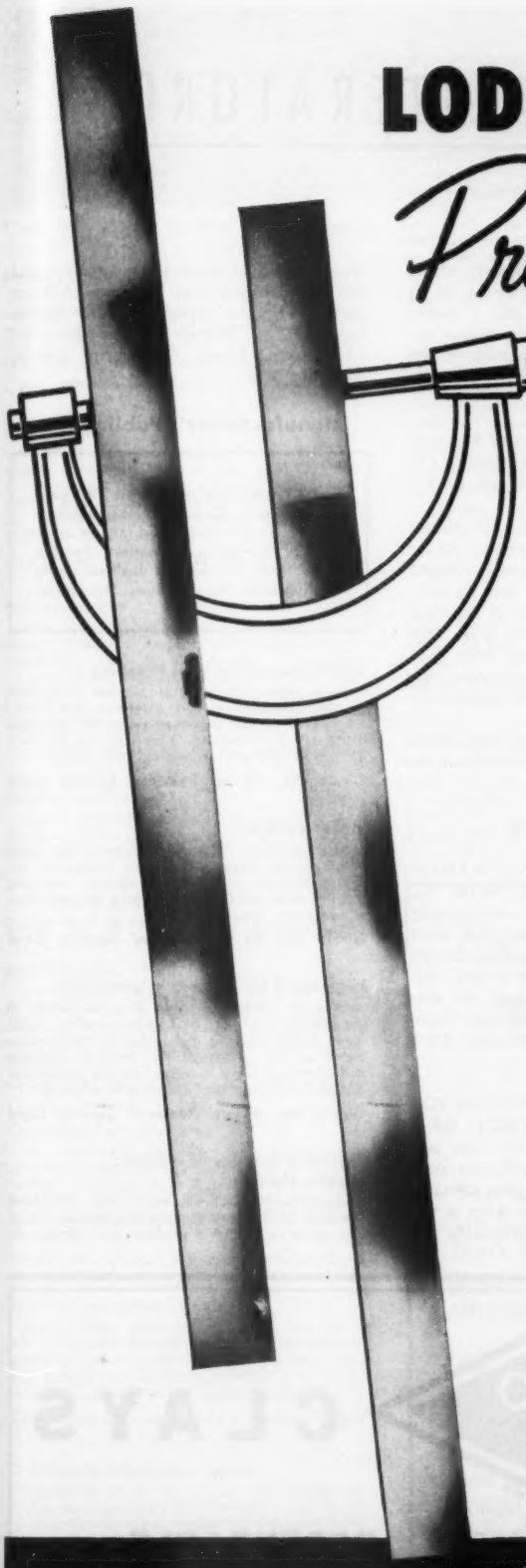
The system consists of feed conveyor, vertical conveyor and discharge conveyor with interlocking electrical safety switches at each transfer step. The interlocking switches work in conjunction with electric-eye beams to insure safe movement of material from floor to floor.

The company welcomes your requests for further detailed information on this system. *Gifford-Wood Co.*

Circle No. 40 on Readers' Service Card

LODDING

Precision Built



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NEW LITERATURE

Books

THE HANDBOOK OF POWERED INDUSTRIAL TRUCKS. Prepared by The Industrial Truck Association, 900 F St. N.W., Washington 4, D.C. 92 pages. Single price $5.00. Special quantity prices upon application.

Three purposes of preparing this book were: (1) to give as complete a picture as possible of the role of industrial trucks; (2) to give such information that will enable a company to select the type truck best suited to a given operation or operations, and (3) to enable a company to best utilize such equipment to realize the many advantages of this type of material handling equipment.

The book is designed to serve as a continuing guide to help a company in its day-to-day handling operations.

1957 BOLTON AWARD. Published by John W. Bolton & Sons Inc., Lawrence, Mass.

Continuing the human relations series which began last year, this 10th Bolton Award has the subject, "My Responsibilities to the Others in My Company". Copies of this book are available from John W. Bolton & Sons Inc.

ACCOUNTING FOR THE FOREST PRODUCT INDUSTRIES. Published by Canadian Institute of Chartered Accountants, Chartered Accountants Building, 69 Bloor Street East, Toronto 5, Ontario, Canada. 61 pages. $1.75 per single copy and $1.50 per copy for orders of 25 or more.

This book provides concise descriptions of the significant aspects of the operations and the special accounting features of the various types of Canadian forest products industries. It is introduced appropriately by a treatise on the logging industry, whose activities represent the initial operation in converting timber resources into a usable form. From this point, the discussions expand to the more specialized areas of the production of lumber, pulp, paper and plywood.

CONTROL VALVES. By Chester S. Beard. Published by Instruments Publishing Co. Inc., 845 Ridge Ave., Pittsburgh 12, Pa. 222 pages. $2.00.

The author presents the subject of control valves in an altogether new manner. As far as is possible, the numerous body designs are discussed with little reference to actuators; the numerous variations in approach to actuator design are covered with little reference to the body. This has been done because, in most cases, the engineer may select one of many actuators to position the valve of his selection.

Line drawings of different type valves and also photos are shown throughout the book.

USDA Reports

HEAVY LOSSES IN AIR SEASONING GEORGIA PINE AND HOW TO REDUCE THEM. Methods of handling and seasoning of Georgia pine that affect the value of the lumber are well covered in this booklet. Photos illustrating different types of lumber stacking are also given. The booklet is available from Southeastern Forest Experiment Station, Asheville, N. C.

AN APPRAISAL OF METHODS FOR SALVAGING SMALL-SAWMILL RESIDUES IN THE SOUTHEAST. Ten possible methods of salvaging pulpable slabs and edging strips from small pine sawmills are presented in this booklet. Also, a system of cost analysis for determining the cheapest method for a given situation and area is outlined and illustrated. When writing for this report, ask for Station Paper No. 84. Address correspondence to: Southeastern Forest Experiment Station, Asheville, N. C.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Tensioning tool for steel strapping

Acme Steel Co. has just released a booklet on the company's new B5 stretcher. The booklet gives complete specifications of the tool and illustrates its versatility. This tool can be used on almost any steel strapping application.

Circle No. 41 on Readers' Service Card

Water softeners

Allis-Chalmers Mfg. Co. features the company's zeolite water softeners in a new bulletin just published. The bulletin outlines how the different type units can be adapted to meet individual plant requirements.

Circle No. 42 on Readers' Service Card

High-speed knives for chip production

John W. Bolton & Sons Inc. Literature on the new Bolton Blue Devil, custom-crafted, high-speed knives for chip production is now available from the company. The bulletin describes and illustrates these knives which are specifically designed for pulp mill chipping conditions.

Circle No. 43 on Readers' Service Card

Physical properties of synthetic organic chemicals

Union Carbide Chemicals Co. has completed the new 1958 physical properties booklet which is a guide to Carbide's products and services. In

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551 Fifth Avenue, New York City

the 28 page booklet the latest physical property data is presented on more than 350 organic chemicals.

Circle No. 44 on Readers' Service Card

Projection microradiography

Philips Electronics Inc. describes and illustrates the company's projection microradiography in a bulletin just published. The text explains how the unit extends the usefulness of light and electron microscope investigations.

Circle No. 45 on Readers' Service Card

Metallic media for solids—liquid separation

Multi-Metal Wire Cloth Co. Inc. A 31-page booklet has been published by the company which fully describes the company's products. The booklet is filled with photos, diagrams and charts along with other technical data.

Circle No. 46 on Readers' Service Card

New Pressafiner

Bauer Brothers Co., which has recently announced the availability of the new No. 560 Pressafiner, has published a 4-page bulletin describing this machine. The bulletin summarizes the unit's operating advantages and discusses Bauer's laboratory test service.

Circle No. 47 on Readers' Service Card

Lumber booklet

Acme Steel Co. is offering a new booklet entitled, "Packaged Lumber and Interlace Load Securement." This booklet describes a simplified yet damage-proof method of packaging and shipping lumber by freight car. The benefits offered by this method may be very successfully used in shipping problems within the mill.

Circle No. 48 on Readers' Service Card

Stock proportioner

Sprout, Waldron & Co. Inc. has just published a bulletin describing the company's Cowan stock proportioner designed for uniform, accurate volumetric metering of pulps. Engineering drawings illustrate both the overflow type and the control-lever type.

Circle No. 49 on Readers' Service Card

Knife grinders

Coe Mfg. Co. has announced improvements in its knife grinder in a 4-page bulletin just published. The contents describe this fully-automatic unit, and a specification chart is also included.

Circle No. 50 on Readers' Service Card

Compressed air dryers

Van Products Co. describes the company's new models of compressed air dryers in a 12-page bulletin. Drawings and photos show the operation of the units. Also listed are operating capacities and sizing graphs along with a technical description.

Circle No. 51 on Readers' Service Card

Rolls for converting machines

Mount Hope Machinery Co. has released a new illustrated bulletin to assist converters in achieving better quality in converting operations. The bulletin has drawings showing nine recommended locations on converting machines.

Circle No. 52 on Readers' Service Card

Continuous consistency control

Fischer & Porter Co. in a new catalog describes the company's Plastometer—a device for continuous automatic control of the consistency of fibrous or pulpy slurries.

Circle No. 53 on Readers' Service Card

Techniques in obtaining employees

Manpower Inc. offers 100 suggestions for hiring and holding help. This is a handy check list for those concerned with the procurement of competent personnel and the reduction of employee turnover. Questions enable you to analyze your company's effectiveness in advertising for help, treatment of employees, benefits, indoctrination of new employees, etc.

Circle No. 54 on Readers' Service Card

Pulping unit

Morden Machines Co. is offering two data sheets describing the company's Slush-Maker—a pulping unit used for continuous pulping. One data sheet gives technical details on the unit's continuous operation. The other sheet gives information on the use of the unit for dry-end pulping and deinking.

Circle No. 55 on Readers' Service Card

Engineering report on mixing

Rietz Mfg. Co. has prepared a 4-page bulletin titled, "Engineering Report on Mixing," which is devoted entirely to continuous mixing operations. The bulletin covers mixing of solids with solids, solids with liquids, heating or cooling during mixing operations and the mixing of high-viscosity liquids for the production of plastic or pasty masses.

Circle No. 56 on Readers' Service Card

Article on ferrous metal corrosion

Babcock and Wilcox Co. is offering a reprint of an article titled, "The corrosion of ferrous metal tubing in refinery service". The article deals with separate phases of ferrous metal corrosion in the refinery field.

Circle No. 57 on Readers' Service Card

Controlled-volume pumps

Milton Roy Co. has described its metering pump with diaphragm liquid end. Capacities, pressures and materials of construction are also given.

Circle No. 58 on Readers' Service Card

The Paper Industry
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Now available in book form

Technology of Paper Coating

by H. Witcoff
Director of Chemical Research, General Mills Inc.
and A. W. J. Dyck
Editorial Director, The PAPER INDUSTRY

The latest developments in the technology of paper coating are brought to the reader clearly and concisely in this new book that is based with some revision on a series of articles appearing in The PAPER INDUSTRY from May 1956 through May 1957.

The up-to-the-minute techniques in general use are described in detail. Various specific methods of on-the-machine and off-the-machine coating processes are described and illustrated. Of major importance is the discussion of properties and uses of new as well as established organic and inorganic coatings in wide and specialized usage. A number of typical formulations are shown.

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POSTERS
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Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in two sizes: "A" size, 8½"x 11½", and "B" size, 17x23". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

425 N. Michigan Ave.
Chicago 11, Illinois

SAFETY NEWS

KIMBERLY-CLARK CORP. fire chiefs from United States and Canadian mills met recently for a four-day brush-up training course. One of the field trips included a visit to the test field of Ansul Chemical Co. in Marinette, Wis. (above), where dry chemical extinguishers were used to combat a gasoline spill fire. Training at K-C's Neenah headquarters included discussions on fire brigades, mill problems, fire insurance, fire hazards, fire prevention promotion and visits to near-by company mills.

86 Perfect Scores Reported to NSC in Nine-Month Period

FOR THE NINE months ending September 30, a total of 86 contestants have reported perfect scores in the 1957 Paper Industry Safety Contest sponsored by the National Safety Council. Some 597 mills are entered in the competition.

This compares to 72 perfect records for the same period a year ago. At that time there were 540 contestants.

The January-to-September frequency rate for Divisions I and II was 7.05, the same as that recorded during the first nine months of 1956. Pulpwood Logging (Division III) registered an 85.76 frequency, up 56 per cent from a year ago.

In the Pulp & Paper Div. the nine-month rate was 6.72, unchanged from a year ago. In Paper Converting a rate of 7.93 represented a 1-per cent decrease.

Contestants working the most manhours in the January-September period with perfect records were: Nekoosa-Edwards Paper Co., Port Edwards, Wis.; Marinette Paper Co., Fort Edward, N. Y., and Flintkote Co. at Meridian, Miss.

Perfect scores recorded for the first nine months were as follows:

Division I—Pulp and Paper Mills

Group A

Nekoosa-Edwards Paper Co., Port Edwards, Wis.

Group B

Marinette Paper Co., Marinette, Wis.; Brunswick Pulp & Paper Co., Brunswick, Ga.; Escanaba Paper Co., Escanaba, Mich.; Chesapeake Corp. of Virginia, West Point, Va.

Group C

Falls Paper & Power Co., Oconto Falls,

CLASSIFIED ADVERTISING

INDUSTRIAL ENGINEER WANTED

Graduate Industrial Engineer with practical experience in the paper industry. A knowledge of paper finishing is desirable. Should have ability in organization, expansion, mechanization and labor relations. Under 38 years of age, good salary and benefits. Fine opportunity for a man who is energetic and desires a challenge. Send detailed resume of experience and education to Personnel Manager, West Virginia Pulp and Paper Co., Luke, Maryland.

AGENTS

Wanted to sell new Tin base slime control material. Non-corrosive to wires. Paper mill personnel may act as agents in spare time. Confidential. Write Box 657, The Paper Industry.

WANTED — SALES MANAGER

Michigan manufacturer of sawmill and paper and pulp mill equipment with national distribution has opening for man to take complete charge of sales and sales promotion. Reply with complete details, outlining your background to Mr. Gus Richter, Jaqua Company, 101 Garden Street, S.E., Grand Rapids, Michigan.

WANTED

For central engineering department of multi-plant concerns:

(A) Mechanical design engineers with knowledge of steam equipment and heat transfer desirable.

(B) Electrical design engineer to eventually take charge of electrical division.

Location south, type of work involves mechanization and automation of interesting nature. Some board work required.

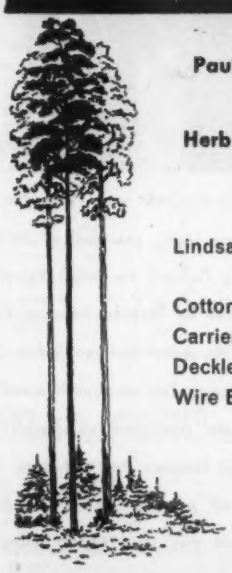
Address all replies to Box 662, The Paper Industry

OPPORTUNITY

Have you seen the book ads on pages 955, 958, and 960 of this issue? You can't afford to miss the opportunities they offer for broadening your knowledge of papermaking.

WILLIAMS-GRAY COMPANY

221 North LaSalle Street, Chicago 1, Illinois



Paul Foster • Peter Talbot

Ross Lawrence

Herb Fishburn • Wes Gallup

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- **Eliminate Costly Maintenance**

thru this NEW CONCEPT in MEASURING FLOW thru PARSHALL FLUMES

with a

BURGESS-MANNING TYPE "ML" METER INSTALLATION

You completely eliminate such installation costs as: excavation for dry well; concrete dry well foundation and walls; metal float well and cover; connecting telltale piping, valves and fittings between Parshall Flume and float well; float cable and protecting piping; clear water piping and fittings for back-purge system, and metal grating to cover dry well.

And, most important, the only maintenance you will have is the possible hosing off, in a few seconds, of the float once in many weeks. Receiver may be located up to 5000 feet from transmitter.

Write for Burgess-Manning "ML" Meter Bulletin.

Think of the savings! Think of the elimination of maintenance!

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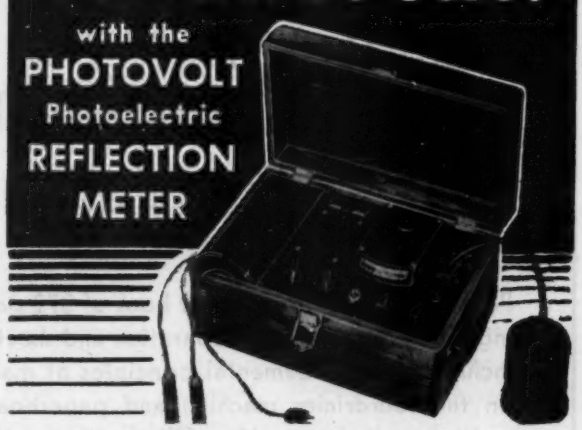
with the PHOTOVOLT Photoelectric REFLECTION METER



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Safety News . . .

(Continued from page 956)

Wis.; National Vulcanized Fibre Co., Yorklyn, Del.; Cornell Paperboard Products Co., boxboard mill, Milwaukee; Fraser Companies Ltd., Newcastle, N. B.; Blandin Paper Co., Grand Rapids, Minn.; Riegel Paper Corp., Warren Glen, N. J.

Group D

Strathmore Paper Co., Turners Falls, Mass.; Congoleum-Nairn Inc., Cedarhurst, Md.; Certain-Teed Products Corp., York, Pa.; United States Gypsum Co., Oakmont, Pa.; New Haven Board & Carton Co., Ilchester, Md.; Marathon Corp., Ashland, Wis.; Fort Orange Paper Co., paper mill, Castleton-on-Hudson, N. Y.; Certain-Teed Products Corp., Richmond, Cal.; Celotex Corp., Los Angeles; Container Corp. of America, Chattanooga, Tenn.; Coos Bay Pulp Corp., Empire, Ore.; Flintkote Co., Lockport, N. J.; Certain-Teed Products Corp., Niagara Falls, N. Y.

Group E

Bestwall Gypsum Co., Pryor, Okla.; Mead Corp., Nashville, Tenn.; United States Gypsum Co., North Kansas City, Mo.; National Gypsum Co., Kalamazoo, Mich.; United States Gypsum Co., Galena Park, Texas; Celotex Corp., Metuchen, N. J.; American Writing Paper Corp., Albion Div., Holyoke, Mass.; St. Regis Paper Co., Muskingum Fiber Products Co. Div., Coshocton, Ohio; Flintkote Co., Little Ferry, N. J.; Celotex Corp., Madison, Ill.; United States Gypsum Co., Oakfield, N. Y.

Robertson Paper Box Co. Inc., Montville, Conn.; United States Gypsum Co., Gypsum, Ohio; International Paper Co., Livermore Falls, Maine; Container Corp. of America, Wilmington, Del.; Johns-Manville Corp., Tilton, N. H.; National Gypsum Co., Newburgh, N. Y.; International Paper Co., Riley, Maine; National Vulcanized Fibre Co., Marshall Bros. mill, Yorklyn, Del.; Charmin Paper Products Co., Little Rapids, Wis.; Spaulding Fibre Co. Inc., Hayes plant, North Rochester, N. H.

Division II—Paper Converting

Paper Bags

Thilmany Pulp & Paper Co., bag mill, Kaukauna, Wis.; St. Regis Paper Co., Kansas City, Mo.; Pillsbury Mills Inc., Wellsburg, W. Va.; St. Regis Paper Co., Playa Ponce, Puerto Rico.

Boxes and Cartons

Group A

Sealright Co. Inc., Kansas City, Kans.; Container Corp. of America, cartons, Fort Worth, Texas.

Group B

Fibreboard Paper Products Corp., carton plant, Portland, Ore.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Dallas, Texas; Fibreboard Paper Products Corp., container plant, Sumner, Wash.; Container Corp. of America, Santa Clara, Cal.; Continental Can Co., Grand Rapids, Mich.; Hoerner Boxes Inc., Sand Springs, Okla.; Container Corp. of America, Greensboro, N. C.

Bradley & Gilbert Co., Louisville, Ky.; Container Corp. of America, Lake Shore plant, Chicago; Container Corp. of America, Carton Div., Seattle; Container Corp. of America, Traver Div., Chicago; Container Corp. of America, Muskogee, Okla.; Fibreboard Paper Products Corp., San Joaquin, Cal.; Mott Carton Co., St. Louis.

Roofing Paper

Ruberoid Co., Joliet, Ill.; Ruberoid Co., Erie, Pa.; Certain-Teed Products Corp., Dallas, Texas; Ruberoid Co., Minneapolis; Ruberoid Co., Millis, Mass.; Johns-Manville Corp., Marrero, La.; Ruberoid Co., Baltimore; Flintkote Co., Pioneer Div., Portland, Ore.; Brantford Roofing Co. Ltd., St. John, N. B.; Certain-Teed Products Corp., Tacoma, Wash.; Brantford Roofing Co. Ltd., Thorold, Ont.

Insulation and Building Board

Flintkote Co., Meridian, Miss.; Johns-Manville Corp., Jarratt, Va.; Simpson Logging Co., Shelton, Wash.

Specialties

Marinette Paper Co., Fort Edward, N. Y.; Crown Zellerbach Corp., San Leandro, Cal.; Marinette Paper Co., South Glens Falls, N. Y. (mill idle); Container Corp. of America, Piqua, Ohio; Lily-Tulip Cup Corp., Galva, Ill.

Division III—Pulpwood Logging

Chesapeake Corp. of Virginia, West Point, Va.; Spruce Falls Power & Paper Co. Ltd., Kapuskasing, Ont.

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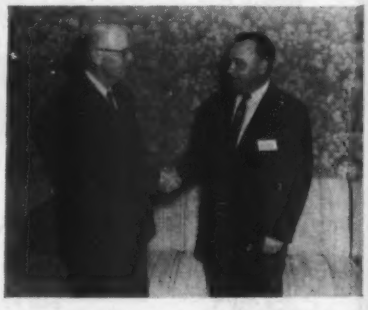

CONGRATULATIONS were extended by Ned Dearborn (left), president of the National Safety Council, to Ernest Berryman, safety director for Nekoosa-Edwards Paper Co., during the recent National Safety Congress in Chicago. The occasion honored the 2,000,000 safe man-hours completed October 23 by Nepco's Port Edwards, Wis. mill. The best previous record established by the plant was the 944,600 hours recorded in 1950.

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light silesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cutting	—

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.70— .75
No. 2 roofing (Chicago)	.50— .55
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	4.75— 5.00
Gunny No. 1, foreign	4.50— 5.00
No. 1 manilla rope, domestic	5.00—
No. 1 manilla rope, foreign	—
New burlap cuts (soft)	6.00— 6.50
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	105.00—115.00
No. 1 hard white shavings	85.00— 90.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	55.00— 65.00
Fly leaf shavings, No. 1	17.00— 22.00
Fly leaf, woody, No. 1	17.00— 22.00
Mixed colored shavings	18.00— 20.00
No. 1 books and magazines	17.00— 18.00
Ledger stock, white, No. 1 (carloads)	40.00— 45.00
Ledger stock, colored, No. 1 (Midwest ship)	25.00—
New manila envelope cuttings (free of groundwood)	60.00— 65.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	50.00— 60.00
Colored tab cards	40.00— 50.00
New northern kraft envelope cuttings	60.00— 65.00
Triple sorted kraft, 100%	25.00— 30.00
No. 1 old kraft	25.00—
White news cuts, No. 1	50.00— 55.00
No. 1 overissue news	14.00— 16.00
Folded news, special	15.00— 16.00
Folded news, ordinary	12.00— 14.00
Old corrugated boxes	20.00— 21.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	6.00— 7.00
No. 1 mixed paper	2.00— 5.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, work, cwt.	5.20—
1-Arginine, drums, kilo	74.80—
Blanc Fixe	
Direct process, bags, C. l., works, ton	115.00—
L. c. l., ton	125.00—
Bleaching Powder, drums, cwt.	
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00—
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.15—
Glycerine, refined (CP, USP) 99%, drums, c. l., delivered lb.	.29⅜—
Litharge, commercial powdered	
Barrels, c. l., works, freight equalled, lb.	.14¼—
Rosin, gum, c. l., f.o.b. New York, cwt.	
E	—
F	—
G	—
WW	9.35—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	7.60—
N	7.70—
WG	8.15—
WW	8.40—
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt.	4.70—
Solid, 76%, drums, c. l. works, cwt.	4.30—
Sodium Silicate	
40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	25.00—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—
High-tinting, drums, c. l., lb.	—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l., freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	—
Sulfite screenings	
Sulfate screenings	
Groundwood, dom.	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.05
No. 2 enamels	19.05
Machine-coated, 45- to 100-lb.	15.05— 18.50
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	64.70
75% "	49.65
50% "	37.80
25% "	31.90
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	65.85
75% "	50.80
50% "	39.00
25% "	33.10
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed	
No. 1	22.50
No. 2	21.75
No. 4	20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.70
No. 2	22.95
No. 4	21.55
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Tissues (carlots)	per ream
White No. 1	
White No. 2	
Bleached anti-tarnish	
Colored	
Anti-tarnish kraft	
Manila	
Napkins, semi-crepe (12½ lb. to M shts) per case	
Napkins, full crepe and embossed (12½ lb. to M shts) per case	
Toilet, bleached (M shts) per case	
Toilet, unbleached (M shts) per case	
Wrappings (kraft, basis 50 lb. and heavier)	per cwt
Standard wrapping	9.50
Butchers, counter rolls	10.50
Standard bagging, mill rolls	
Shipping sack, mill rolls	
Gumming, mill rolls	
Asphalting, mill rolls	
Envelope, mill rolls	

Names in the News . . .

(Continued from page 937)

1920, Andrews has held such positions as chemist, control superintendent, technical director, director of research and executive assistant. He was named to the vice presidency in 1951.

I. H. Andrews

N. V. Edmonson

Norman V. Edmonson has been named paper mill superintendent at the Chester, Pa. plant of Scott Paper Co. With the firm since 1938, he was named a division manager at Chester in 1953.

Byron L. Wehmoff, a pioneer in standardizing printing quality and mechanical performance, has retired after 22 years on the staff of West Virginia Pulp & Paper Co.

Allied Personalities . . .

Walter R. Brandt, for the past six years manager of textile, paper and leather chemicals, has been named branch manager of the West Coast sales office of General Dyestuff Co. In addition, he will serve as western regional manager for Antara Chemicals. (Both firms are sales divisions of General Aniline & Film Corp.)

Andreas Christensen, recently retired as production manager of Spruce Falls Power & Paper Co. Ltd. in Kapuskasing, Ont., has joined the staff of Chemipulp Process Ltd. and Chemipulp Process Inc. He will "extend the services of (the firms) to the pulp and paper manufacturers of the United States and Canada".

Fred Kouka, a member of the foreign erection staff for the past three years, has been appointed manager of Chicago Bridge & Iron Co.'s foreign erection division.

Robert M. Cook has been named vice president and general manager of Ross Midwest Fulton Corp., a subsidiary of the J. O. Ross Engineering Div. of Midland-Ross Corp. He was formerly vice president and chief engineer.

Chester M. Brown has been elected president of the National Aniline Div. of Allied Chemical & Dye Corp. He continues as an Allied Chemical vice president.

Hubinger Co.'s Bulk Div. has announced the following sales personnel changes: **Howard L. Vanderberg** of Kalamazoo, Mich., becomes manager of pulp mill sales; **Howard S. Brightman,** northeastern division manager, and **C. H. Lawrence,** New England manager.

Karl Ivar Ekholm has retired as assistant director of dyestuff sales for the National Aniline Div. of Allied Chemical & Dye Corp. He has been with the firm 34 years.

James E. Irvine has been named assistant director of engineering and **Robert J. Proctor** administrative assistant to the director of engineering for Bauer Bros. Co. Irvine was formerly vice president and chief engineer for Condi Engineering Corp., while Proctor was assistant to the president of Eaton-Dikeman Co.

Walter D. Willetts has been named sales engineer for Albany Felt Co. in the states of Florida, Georgia, South Carolina and part of Alabama. He was formerly a service engineer.

Alvin C. McCully, since May 1956 a sales assistant, has been named a sales engineer in the eastern territory of Samuel M. Langston Co.

William J. Fondow, formerly associated with Michigan Paper Co., has been appointed sales representative for the Emerson Mfg. Co. Div. of John W. Bolton & Sons Inc. He will cover Wisconsin, Michigan and part of Minnesota.

David T. Barry, formerly director of marketing, has been named to the newly created position of general sales manager for Stowe-Woodward Inc.

Thurston L. Yocum, for the past 10 years a sales engineer, has been made manager of E. D. Jones & Sons Co.'s new Zenith Pulp Press Div.

Ben F. Melucci, formerly technical director of the manufacturers chemicals department, has been appointed chemical development manager for the Industrial Chemicals Div. of American Cyanamid Co.

Necrology . . .

Charles H. Burrows

Charles H. Burrows, 87, veteran of the paper manufacturing industry, died January 11 in Skaneateles, N. Y.

He retired from the presidency of Mohawk Paper Co. Inc. of Little Falls, N. Y., in 1950.

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E. C. D. Cameron

Ewan Charles Donald Cameron, former vice president and secretary-treasurer of J & J Rogers Co., died recently at his Au Sable Forks, N. Y. home at the age of 65.

A native of Australia, Cameron came to New York, N. Y., shortly after World War I as a certified public accountant on the staff of Price, Waterhouse & Co.

Albert E. Cleghorn

Albert E. Cleghorn, president of the National Aniline Div. of Allied Chemical & Dye Corp., died unexpectedly January 9 while riding in a New York, N. Y. taxicab. He was 52 and had been named to his post only last October 21. He assumed charge of the division November 1.

A native of South Dakota, Cleghorn worked for Foster D. Snell Inc. after teaching briefly at Long Island University. He joined Allied Chemical & Dye in 1933.

K. A. Forrest

Kewick A. Forrest, prominent in the West Coast pulp and paper industry for many years, died recently in Israel. He was a consultant to foreign countries on the development and expansion of pulp and paper manufacture.

During the 1920s Forrest was associated with Crown Zellerbach Corp. kraft pulp mills in Ocean Falls, B. C., and Camas, Wash. He was later on the staff of Brown Paper Mill Co. Inc. at West Monroe, La.

Brandon B. Hodges, 54, assistant secretary of the Carolina Div. of Champion Paper & Fibre Co., died in December in Asheville, N. C. He was considered one of the state's foremost authorities on taxation.

J. Frank Key, 67, former president and general manager of Columbian Paper Co. of Bristol, Va., died recently at Buena Vista.

Louis S. Wertz, 68, founder and former president of Intrusion-Prepakt Inc., died in December at Phoenix, Ariz. An authority on concrete construction, Wertz founded Intrusion-Prepakt in 1934.

W. C. Christianson, 50, general sales manager of Trent Tube Co., died in December following 35 years in the tubing industry. (Trent Tube is the East Troy, Wis. subsidiary of Crucible Steel Co. of America.)

Leland K. Spink, 58, engineer in charge of flow measurement at Foxboro Co., died December 23 in Foxboro, Mass. An authority on flow measurement, he pioneered in calculating and coordinating flow data.

William A. Ritchie, 58, production superintendent for paper mill and stock products for Marathon Corp. at Menasha, Wis., died at his home December 30.

Leonard A. DeGuere, 81, architect and engineer who specialized in projects for the pulp and paper industry, died January 3 at his Wisconsin Rapids, Wis. home. From 1905 to 1925 he handled practically all major engineering projects for Consolidated Water Power & Paper Co.

Homer E. Benton, 71, secretary of Northern Paper Mills during the 1920s, died in December at his Appleton, Wis. home.

Measurement of moisture content in chips

A unique moisture-measuring technique is being used successfully by Howard Smith Paper Mills Ltd. A Hygrotester, in the form of a 2-ft. sq. plastic plate in which three large electrodes are imbedded, is installed in a chip chute.

The electrodes function as condenser plates giving rise to a minute but sensitive electric field above the plates. As the chips travel in uniform thickness (minimum thickness 3 in.) across the electrodes, the variation in the moisture content in the chips changes the electrical characteristics of the field.

After establishing an empirical relationship between meter readings and the moisture content of the chips, the method lends itself quite satisfactorily to chip moisture determinations.

Advantages of the "magnafite" pulping process

The magnafite pulping process developed by Howard Smith Paper Mills Ltd. involves cooking with a magnesium bisulfite solution without the normal excess of sulfur dioxide. The process has the advantages of (1) shortened cooking schedules; (2) production of superior pulps; (3) use of a single recovery system for both chemical and semichemical pulps; (4) use of a variety of wood species as well as mixed species, and (5) the use of low liquor-to-wood ratios.

Correcting basis weight variations on the wire

Pressure pulsations in the approach piping to the headbox that are the cause of basis weight variations can be reduced to a minimum by (1) reducing air quantity in the system as much as possible; (2) keeping the head on stock and fan pumps to a minimum, (3) designing regulating valves in such a way as to avoid separation; (4) designing piping in such a way as to maintain uniform velocity and avoid separation, and (5) providing for a free surface either in the form of an open tank or a surge tank between the source and the headbox, where sources of elastic pressure waves are present.

Paper machine improvements desired

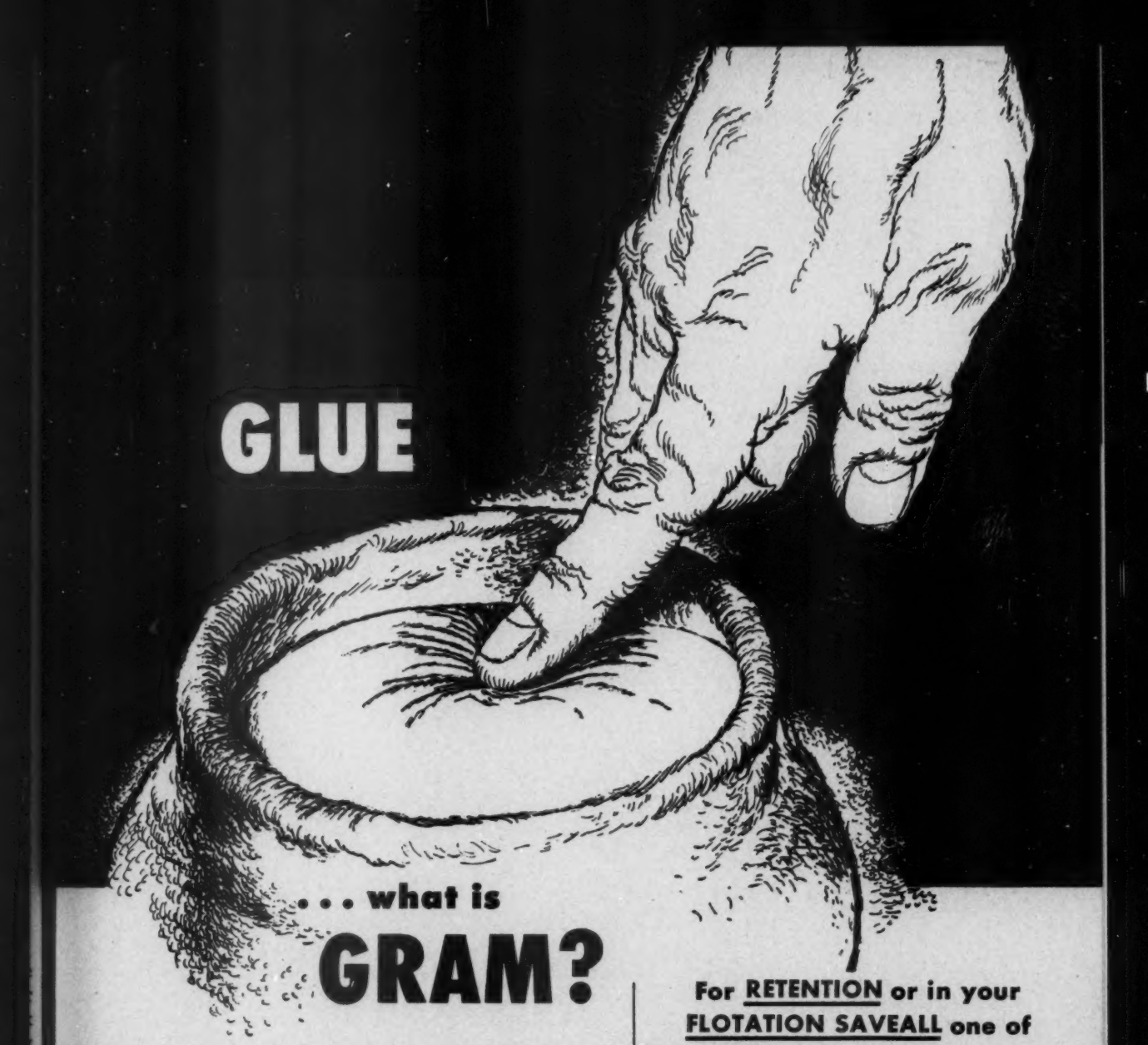
According to S. J. Leishman of Provinicial Paper Ltd., the following improvements are desirable in a fine paper machine:

(1) a stock system that will eliminate foam;

(2) a stock system that does not refine or slow stock in pumps, agitators, etc.;

(3) an adequate headbox and slice that will deliver a uniform weight of stock and volume across the width of the web, and

(4) a fourdrinier wire long enough to minimize the high vacuum required on high-speed slow stock.



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It's a measurement of GEL STRENGTH, which in turn is an indication of flocculating activity.

In the old days, the strength of a glue was judged by poking a finger into a chilled glue gel. The degree of resistance determined the grade.

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